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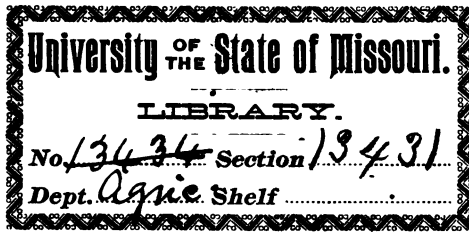
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C. C. WOODSON,

State Mine Inspector.

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FIFTH ANNUAL REPORT

OF THE

STATE MINE INSPECTOR

OF THE

STATE OF MISSOURI

FOR THE

YEAR ENDING JUNE 30, 1891



JEFFERSON CITY, MO.:

TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.
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LETTER OF TRANSMITTAL.

STATE OF MISSOURI,
OFFICE OF STATE MINE INSPECTOR. }

To the Hon. W. C. HALL, Com'r of Labor, Jefferson City, Mo.:

SIR—I have the honor herewith to submit to you the fifth annual report of this Department, for the year ending June 30, 1891.

In presenting this report, it affords me much pleasure to be able to state that we have passed another year in comparative peace between miners and mine operators, only a few local strikes having occurred, and those adjusted without violence.

Considering the mildness of the winter, the coal trade during the past year has been remarkably good, this report showing an increased production of 8½ per cent over the previous year.

The lead and zinc industry has been exceedingly active—the output having surpassed any previous year in the State's history, while the iron product shows a decrease as compared with the report of 1890.

The report affords special information as to the general character and location of each mine, method of mining, production and mineral output, statistical tables showing number of employes, record of accidents, opening of new mines and closing of exhausted mines, and such other information as will, I hope, be of interest to the mining industry of the State.

Very respectfully,

C. C. WOODSON,

State Mine Inspector.

REPORT.

This is the fifth annual report of this character made for the State. It contains statistics of the coal, zinc, lead and iron industry, with a general description and location of each mine.

In compiling these statistics every precaution was taken to make the information as complete as possible and in such form as to be easily understood. A great deal of time was spent in collecting statistics from mine operators, and in some cases it was necessary to write several letters to a single company, and in a few instances have had to visit mines in person before getting the information desired. But as a rule, mine operators and superintendents have shown a disposition to give us all the information desired. To such operators and managers I desire to return thanks.

A glance at the following table shows a healthy condition of the mining industries of the State as compared with the preceding year. The report of that year shows the value of the mineral output to have been \$8,165,865, while this report shows the value of output to be \$8,896,995, an increase of nearly 9 per cent. It also shows that in producing this amount of wealth 30 lives were lost, 16 wives made widows, 53 children made fatherless, and one life lost for every 413 persons employed, based only on the average number of men at work.

Another interesting feature of the table is the number of employes at Missouri mines. The total number of 12,392 employes shows that a population of no less than 49,568 people is directly dependent on the mines for support, for a ratio of four to one is a very moderate one.

Table 1.—Showing Summary of General Results of Investigations in Coal, Lead, Zinc and Iron Mines,

For year ending June 30, 1891, as compared with the year ending June 30, 1890.

	1890.	1891.	Increase over 1890.
Number of mines of all kinds.....	840	1,012	172
Total value of minerals at mines.....	\$8,165,865	\$8,896,995	\$731,130
Total average number of employes of all kinds	11,562	12,392	830
Total average number of miners	7,654	8,141	487
Total number of other employes.....	3,908	4,251	343
Total number men killed	24	30	6
Total number wives made widows	14	18	4
Total number children made fatherless.....	27	53	26
Total number non-fatal accidents	38	55	17
Average number of employes for each life lost.	448	413	.....

Table 11.—Comparison of Product of Coal, Lead, Zinc and Iron Mines for the past three years—in tons.

	Coal.	Lead.	Pig lead.	Zinc.	Iron.
1889.....	2,223,477	9,469.05	25,440.05	82,357.05	251,006
1890.....	2,437,399	12,909.02	20,451.04	100,248.01	232,835
1891.....	2,650,018	16,925.19	19,968.81	123,752.00	138,356
Totals.....	7,310,894	39,303.89	65,860.71	306,357.06	622,197

The coal trade opened up earlier last fall than usual, and by the middle of September miners were in demand in nearly every coal-producing county in the State; most of the coal companies were running their mines every day, and many of them behind with their orders. In some localities, however, the railroad facilities were inadequate, which somewhat hindered the progress of mining in such localities. This extra demand continued until about the first of December, at which time the trade began to slacken, since which time the mine operators have had no trouble in supplying the demand. Notwithstanding the mild winter, the coal output shows an increase of 8 2-3 per cent over the preceding year, but the price per ton at the mines has decreased from \$1.32 in 1890 to \$1.31 1-3 in 1891.

The following table shows that 2,650,018 tons of coal were produced during the past year by 385 mines (including 81 "strip-pits"), located in 37 counties. These mines furnished employment to 8,104 persons in winter and 5,654 in summer, or an average for the year of 6,879—an increase, as compared with the report of 1890, of 406 in winter and 749 in summer.

In producing this amount of coal, 55,356 kegs of powder were used, giving an average of 47.87 tons to the keg, against 54.4 tons per keg for the preceding year. The use of powder varies in each county, owing to the nature of the coal, character of overlying roof and the method of mining. For instance, no powder is used by the miners in getting the coal in Lafayette and Ray counties, yet these two counties produce nearly 24 per cent of the State's output. Bates and Macon counties, on the other hand, use 43,816 kegs in producing 1,180,302 tons of coal.

The aggregate number of accidents reported during the past year was 18 fatal and 32 non-fatal, against 10 fatal and 20 non-fatal for the report of 1890. This shows one life lost for every 147,223 tons of coal produced, and one non-fatal for every 82,813 tons.

Table III.—Summary of the General Results of Investigations in Coal Mines

For year ending June 30, 1891, compared with the year ending June 30, 1890.

	1890.	1891.	Increase over 1890.
No. of counties producing coal.....	31	37	6
No. of mines, including strip-pits.....	299	385	86
No. of mines employing more than ten men.....	124	141	17
No. of fans in use.....	36	42	6
No. of tons of coal produced.....	2,437,399	2,650,018	212,619
Value of coal at mines.....	\$3,234,351	\$3,480,867	\$246,516
Value of coal per ton at mines.....	\$1 32	\$1 31	.....
Total number of all employes in winter.....	7,698	8,104	406
Total number of all employes in summer.....	4,905	5,654	749
No. of miners in winter.....	6,259	6,541	282
No. of miners in summer.....	3,876	4,433	557
No. other employes in winter.....	1,439	1,563	124
No. other employes in summer.....	1,029	1,221	192
No. kegs powder used.....	44,754	55,356	10,602
Cost of powder.....	\$102,296	\$119,504	\$17,208
No. of men killed.....	10	18	8
No. of wives made widows.....	5	11	6
No. of children made fatherless.....	9	41	32
No. non-fatal accidents.....	20	32	12
No. tons coal mined for each life lost.....	243,739	147,223	.....
No. tons mined for each non-fatal accident.....	87,049	82,813	.....
No. new mines opened (small mines not included).....	21	17	.....
No. mines worked out or abandoned.....	12	5	.....

NEW COAL MINES OPENED

AND OLD ONES ABANDONED OR WORKED OUT.

During the year ending June 30, 1891, there have been seventeen new mines opened, while only five have been worked out or abandoned. The mines opened are located in Audrain, Bates, Caldwell, Callaway, Grundy, Henry, Macon, Randolph, Ray, Sullivan and Vernon counties, and the abandoned mines are located in Audrain, Bates, Henry and Macon counties.

The report of 1890 shows twenty-one new mines to have been opened and twelve abandoned. While this report shows four mines less opened, it shows that only five have been abandoned.

By a glance at the following table, it will be seen that four out of the five companies worked out and abandoned a mine only to open another :

County.	New mines opened.	Worked out or abandoned.
Audrain.....	Vandalia Coal Co.....	Vandalia Coal Co.....
Bates.....	Missouri C. and C. Co.....	Keith & Perry Coal Co. No. 6.
Bates.....	Western Coal Mining Co. No. 3.	W. W. Lucas
Bates.....	Rich Hill Coal Mining Co.....	.....
Bates.....	Woodson and Woodson.....	.....
Caldwell.....	Kingston Coal Co.....	.....
Callaway.....	A. Holmes.....	.....
Grundy.....	Grundy County Coal Co.....	.....
Henry.....	Woods & North Coal Co.....	Woods & North Coal Co.....
Macon.....	Kansas & Texas Coal Co., mine 33	Kansas & Texas Coal Co. No. 41
Macon.....	Bevier Black Diamond Coal Co..	.....
Randolph.....	Randolph County Coal Co. No. 13	.....
Randolph.....	Enterprise Coal Co.....	.....
Ray.....	Cravens Coal Co.....	.....
Sullivan.....	Milan Land and Coal Mining Co.	.....
Vernon.....	G. S. Hoss.....	.....
Vernon.....	Keith & Perry Coal Co. No. 7....	.....

IMPROVEMENTS MADE IN COAL MINES.

Considerable improvements have been made in and about many of the mines during the past year. The good work of erecting fans to take the place of furnaces has continued, as will be seen by a glance at the following table. Three of the shafts sunk during the past year were equipped with fans; these, in addition to those erected at the old mines, show eleven fans to have been put in during the year.

IMPROVEMENTS MADE IN COAL MINES IN STATE DURING THE YEAR
ENDING JUNE 30, 1891.

Air and escapement shafts sunk....	13	Revolving screens	2
Fans erected.....	8	Railroad switches put in.....	3
Furnaces.....	5	Safety catches.....	2
Stairway built.....	2	Mining machines.....	14
Miners' houses erected.....	132	Connection with second opening....	2

Detailed Statement, by Counties, of Improvements made in Coal Mines during the Year ending June 30, 1891.

County.	Name of Company.	Improvement made.
Adair.....	Penn. Coal Co.....	Put in cylinder, boiler and 10-foot fan.
Andrain.....	Andrain Mfg. Coal & M. Co.....	New air-shaft sunk and furnace erected
Barton.....	C. H. Morgan.....	Revolving screen, 10-foot fan and new safety catches.
Barton.....	Wear Coal Co.....	Airsplit into four currents and 32 new houses built.
Bates	Rich Hill Coal M. Co..	Stairs erected in Mine No. 14; escape-ment shaft; air compressor erected and 14 mining machines put in.
Bates	J. M. Wise Coal Co. ..	Tram road built to switch and air-shaft sunk.
Boone.....	Columbia Coal Co.....	New cages, ropes and safety catches.
Boone.....	W. A. Gooding Coal Co	Air and escapement shaft sunk and furnace erected.
Caldwell.....	Caldwell Coal Co.....	Shaft sunk to second seam.
Henry	Blair Diamond Mine..	Air-shaft sunk.
Henry	Keith & Perry Coal Co	Tip-house burned and rebuilt, and 14-foot fan put in.
Henry	Co-operative Coal Co..	8-foot fan erected.
Lafayette.....	Bonanza Coal Co.....	Railroad switch put in.
Lafayette.....	J. E. Wilks.....	Escapement shaft sunk.
Lafayette.....	Jackson & Taggart....	Air and escapement shaft sunk.
Lafayette.....	Lexington Coal & M. Co.....	New furnace at Graddy mine and 10-foot fan erected at McDowell mine.
Lafayette.....	Missouri River Coal & M. Co	Escape shaft sunk.
Linn.....	Kansas & Texas Coal Co	Escapement shaft sunk; ladders put up in same, and 10 houses built.
Macon.....	Kansas & Texas Coal Co	12-foot fan erected at Mine 43, and revolving screen put in; also 21 houses built; an air-shaft sunk at 27; about 200 new mining cars have been built, nearly 2 miles of switches laid and about 50 new houses built at Ardmore mines.
Macon.....	Watson Coal & M. Co.	Roadway around shaft.
Montgomery,....	Vandalia Coal Co.....	8-foot fan erected.
Putnam.....	Blackbird Coal Co.....	Switch put in; hoisting engine erected and 9 houses built.
Putnam.....	Mendota Coal & M. Co.	Escapement shaft sunk at Mine No. 4; also new air-shaft sunk and furnace erected.
Randolph.....	Interstate M. Co.....	Air and escapement shaft sunk.
Randolph	Randolph County Coal Co	Escapement shaft sunk at Mine No. 3½.
Ray	Bovard Brown Coal Co	Escapement shaft sunk.
Ray	Darneal Coal Co.....	Escapement road completed and new cages erected.
Ray	Kansas & Texas Coal Co.....	Ten new houses built.
Ray.....	J. Pickering Coal Co..	Escapement road completed.
Ray.....	Richmond Coal Co.....	Twelve-foot fan at No. 5; also shaft retimbered.

METHODS OF WORKING AND VENTILATING COAL MINES IN THIS STATE.

The method of working depends largely upon the general character of the roof, thickness of seam, and nature of the floor underlying the coal, etc. A seam of coal worked on the pillar and room plan may be operated at a loss to its owner, but if changed to the long-wall plan it may prove a success, and *vice versa*.

Mining is done in this State upon both the long wall and pillar and room plans, but the long-wall system is preferred where the roof and surroundings are adapted to it. By this method all the coal is gotten out, and as a rule, at a reasonable cost. Long-wall is worked in the State upon two different plans, one of which is by using a portable track around the face upon which the miner's coal is conveyed to a roadway leading out to the surface or bottom, and which is pulled forward as the working face advances. These entries or headings are driven off of the main entry from three to five hundred feet apart. The shale or slate overlying the coal and mining dirt is used in building pack walls. (See cut of Lexington Coal & Mining Company's mine.)

The other method of working long-wall is by driving main and cross entries; turning rooms off of the latter, following the main entries. These rooms are cut off by other cross entries or headings every 160 to 200 feet; this method is adapted to and worked successfully in mines having very poor roof. The accompanying map of the Kansas & Texas Coal Mining company's mine No. 32, clearly illustrates this method of working.

The principal mines in operation on the pillar and room plan are located in Barton, Bates, Boone, Callaway, Henry, Putnam, Randolph, Macon and Vernon counties; however, some mines in the above named counties are worked long-wall. The accompanying map of the Rich Hill Coal Mining company's mine No. 13, will give the reader some idea of this plan of working.

The main object we have in including in this report the three plans of mines is to show the different methods of ventilation. By a careful examination of these maps, it will be seen that those mines worked on the long-wall plan can be much better ventilated than those worked on the pillar and room; not that more air can or is forced and circulated through them, but because the ventilating current is forced and circulated around the workings and along the face of each miner's working face, while on the pillar and room plan the air current is usually several yards behind the miner's working place.

Many of the mine operators make a mistake in forcing the entire volume of air through the mine in one continuous current. This prac-

tice could be dispensed with and the mines much better ventilated by splitting the air into several currents, each current ventilating separate groups of men. By this method the ventilating furnace or fan will give better results, the motive power remaining the same; besides, each group of miners would receive fresh air direct from the inlet. Moreover, should a fall occur in one of the air-courses, the ventilation would be affected only in that part of the mine. The method of splitting the air in mines is clearly illustrated in the accompanying plan of the Kansas & Texas Coal company's mine, No. 32.

A mistake made by some mine operators, which has come under my notice during the past year, is in the location of ventilating shafts, where furnaces are to be used as a motive power, in selecting the lowest point on the property, in respect to levels, in order to reach the coal with as little expense of time and money as possible.

This is the practice on the part of some companies in order to save a few dollars in the cost of sinking, but in the end results in loss, due to the extra amount of fuel consumed to produce the required amount of air.

If a furnace is to be used as a motive power, I would recommend that the air shaft be sunk from a high piece of ground, so as to give the furnace the full benefit of the long shaft.

STRIKES.

Ten strikes have occurred among mine employes during the year ending June 30, 1891.

These strikes have all occurred in the coal mines, and their results were as follows:

Six unsuccessful, two succeeded and two compromised. In these ten strikes, 603 employes were thrown out of employment, with an average loss to each of \$39.35, and aggregating a total loss of \$23,730.

For the year ending June 30, 1890, ten strikes occurred, but in only seven was the wage loss ascertained. In these seven strikes 429 men were thrown out of employment, with a loss in wages amounting to \$14,324.

The report of 1889 shows 30 strikes to have occurred in mines, but in only 18 was the wage loss ascertained. In these 18 strikes there were 909 men thrown out of employment, with a loss in wages amounting to \$56,787.

STRIKES BY COUNTIES.

AUDRAIN COUNTY.

Audrain Manufacturing, Coal and Mining Co.—Reduced the price of mining from \$1.00 to 86 cents per ton, April 1; miners struck against the reduction; compromised April 15, by company paying \$1.12½ per ton delivered at shaft bottom; prior to the strike the company received the coal from the miner's working place.

HENRY COUNTY.

Tebo Coal company—Miners struck September 4, because company refused to collect money from each miner to pay for a check-weighman; after being out two weeks they returned to work without succeeding.

JOHNSON COUNTY.

T. H. Boyd & Sons—Miners struck November 26 for an increase of $\frac{1}{2}$ cent per bushel for mining; strike not successful; after being out about one week a part of the miners returned to work, and others later on at intervals.

LAFAYETTE COUNTY.

J. M. Seawell & company—May 1, changed method of paying from semi-monthly to once a month; miners struck; after being out four days, company agreed to pay as heretofore, and miners resumed work.

LINN COUNTY.

Kansas & Texas Coal company, Mine No. 32—Miners signed and sent the following petition to the superintendent:

We, the undersigned miners of Marcelline, do demand our wages every fifteen days in full, according to law.

July 31, the company paid off and discharged all the miners, thus shutting the mine down.

August 13, the miners petitioned the superintendent, as follows:

We, the undersigned former employes, would respectfully petition you to re-open Mine No. 32, at Marcelline, Mo., in order that we may again get employment.

We are willing and ready to be treated as you treat employes at other places operated by you in Missouri, as to terms of payment for our service, which are as follows: For work performed from the 1st to 15th of each month, inclusive, payable on the last day of month, for work performed from the 16th to last day of same month inclusive; pay-day on the 15th of following month.

Company accepted the proposition made by the miners, and work was resumed at once.

MACON COUNTY.

Kansas & Texas Coal company—Miners employed in Nos. 42 and 43, Bevier, struck June 4, against certain rules of the company. (See rules elsewhere.) A part of them accepted company's rules and returned to work two weeks later, and others later on at intervals.

Little Pittsburg Coal company—Company advanced the price paid for mining from 60 to 74 cents per ton in September, but the miners demanded 85 cents per ton, which the company refused to give, hence miners struck for the advance. After being out three weeks returned to work at 74 cents per ton.

RAY COUNTY.

Kansas & Texas Coal company—September 1, miners struck for two weeks' pay. After being out one month compromised by company paying 50 per cent of the wages due them on the 20th of each month, and paying them once each month in full as heretofore.

RANDOLPH COUNTY.

Osage Coal and Mining company—Reduced the price of mining from 94 to 80 cents per ton July 1; miners struck against the reduction. Property was leased to Thos. Fleming about the first of November, who put the miners to work at the reduced price.

VERNON COUNTY.

W. L. Hill—October 3, miners struck for an increase from 75 to 80 cents per ton for mining. Succeeded in their demand and returned to work three days later.

LITIGATION.

It has been necessary to invoke the aid of the courts to enforce the requirements of the mining law at two different mines during the year, which was greatly against my wishes ; but after having exhausted all personal efforts to have the law complied with, I could do nothing more, and an appeal to the courts was my only alternative.

The first of these suits was brought against the Randolph Coal and Gas company, of Randolph, Clay county, to compel them to sink an escapement shaft, in compliance with section 7063, Revised Statutes, which requires all coal mines that shall go into operation for the first time after the first day of January, 1888, to sink an escapement shaft, such shaft to be constructed within one year.

The shaft was sunk the latter part of 1888, but was not put into actual operation until the following year. During the year 1890 the company was requested several times to sink the escapement shaft in question, but it proved of no avail. About the first of this year I filed suit against the officials of the company, who immediately closed the mine pending the result of the suit. The case came up at the June term of the court, and the company was fined \$50 and costs for violating the law.

The other suit was against Mr. John Breckenridge, for violating section 7064, Revised Statutes, which requires one hundred cubic feet of air per man per minute to be forced and circulated through the mine.

In order that I may be more clearly understood, I will give a detailed statement of the condition in which the ventilation was found at each inspection during the past year : I made an inspection of the mine May 29, 1890, and found it poorly ventilated. In fact, only a little more than one-half as much air was being forced and circulated through the mine as the law required. The attention of Mr. Breckenridge was called to this fact, and he was instructed to have air-courses cleaned and the ventilation current increased to at least 100 cubic feet

of air per minute per man, as the law requires, which he promised to do, and in fact gave orders to the boss to put men to work to clean up the air-courses.

Complaint was received at this office in January, 1891, that the mine was again in bad condition. The complainant says in his letter:

I am a practical coal miner and am working in mine No. 3 $\frac{1}{2}$, operated by John Breckenridge at this place, and wish to inform you that the miners are suffering greatly from the effect of poor air, which is caused by a poor system of ventilating and carelessness on the part of the men in charge of the mine.

After receiving this and other complaints of like character from employes of this mine, I wrote Mr. Breckenridge a letter under date of January 22, 1891, informing him of the complaints that were being made against him, and also notified him that if the charges be true he must increase the ventilating current to not less than 100 cubic feet per man per minute within five days from date. I also wrote one of his miners who had made complaint, notifying him what I had done and requesting him to let me know what improvement was being made in the mine to better its condition, and received an answer under date of February 9, 1891, which contained the following statement.

There has been no improvement in the condition of this mine since I wrote before; but the air gets worse as the weather gets warmer, so you can see that your presence is badly needed here.

On receiving this letter I immediately visited and made a thorough investigation of the mine, taking several measurements of the air, the largest measurement being 6,750 cubic feet per minute. On this day there were 88 miners, 4 mules and 6 day-men employed, according to the sworn statement of Mr. Breckenridge before the court. After making this inspection I entered criminal prosecution against the manager for violating section 7064 R. S.

The case came up March 19, in Moberly, before 'Squire Robinson, and resulted in the jury finding the defendant guilty, assessing the fine at \$50 and costs. The case was appealed to the circuit court, and was called on the 28th day of September. The defendant demurred to the petition, which was sustained by the court. On advice of the prosecuting attorney of the county, the case will be taken to the Court of Appeals.

The following is a detail statement of personal examination and investigation of the several mines in each county producing coal:

ADAIR COUNTY.

KIRKSVILLE.

Robert DeSanko.—Mine located about 10 miles northwest of Kirksville; slope; employs from 3 to 5 men in fall and winter. Coal from 3½ to 4 feet thick, and worked pillar and room plan.

An air shaft was being sunk at date of inspection (April 10, 1891).

David C. Scott.—Mine located 11 miles northeast of Kirksville; shaft 30 feet deep; horse hoister; coal about 3½ feet thick and worked pillar and room plan. Mine is operated in fall and winter for home consumption.

STAHL.

James Harriott & Bro.—Mine located near Stahl; drift; worked pillar and room plan. Operate for local consumption.

J. B. Novinger.—Has continued to operate his mine, which is located near Stahl, but for local consumption only. The coal is worked through a drift, and is about 3 to 3½ feet thick.

D. R. Pickens.—Owns and operates a mine in fall and winter for local trade; located near Stahl. Mine was not in operation at date of inspection.

Pennsylvania Coal company.—H. C. McCahan, general manager, and John Dawson, mine sup't.

This company operates two mines, one located at Stahl and the other at Danforth, with general office at Kirksville. Both mines are connected with the Q. O. and K. C. Ry. by switches, and the coal is worked pillar and room plan. Coal is from 36 to 42 inches thick; pay for mining 3½ cents per bushel in summer and 4 cents per bushel in winter.

The mine located at Stahl was inspected April 9, 1891, and seemed to have been somewhat neglected by its managers; the roadway was wet and very muddy, probably worse than usual, on account of the heavy rains that had fallen a few days prior to this inspection. The small ventilating furnace was doing but little good, owing to the poor system of conducting the air around the mine; however, work was being pushed to make connection with a room near head of main entry, which will furnish a reasonably good air return when complete.

The mine located at Danforth is a shaft 50 feet deep; machinery in reasonably good condition; mine was being ventilated by a small furnace at date of inspection (April 9, 1891), which was giving fair results. Roof overlying the coal is good in rooms that are now being worked,

but poor on entries in certain places. Drainage good. A new cylinder boiler has been put in during the past year, and the general condition of the mine much improved.

I have been notified by the superintendent since the above was written, that a 10-foot ventilating fan has been put in to take the place of the furnace.

AUDRAIN COUNTY.

This is one of the few counties in the State that has shown a slight decrease in the output during the past year, as compared with the report of 1890; that report shows an output of 22,813 tons, while this report shows 19,569 tons to have been produced. The average value per ton at the mines has advanced from \$1.32 in 1890, to \$1.53 in 1891.

Audrain Manufacturing, Coal and Mining company.—S. D. Ely, superintendent. Mine located at Vandalia; connected with C. & A. railroad by a switch; machinery in fair condition, but the timbering in hoisting shaft is old and needs to be replaced with new. April 29, the timbering in ventilating shaft gave way and shaft closed in, but a new one was sunk immediately in a more convenient place. It was sunk large enough to afford an escapement shaft also, by bratticing a part of it off.

They are also working a seam of fire-clay in connection with the coal which it underlies.

Ventilation was reasonably good in coal mine, but poor in the fire-clay rooms. However, preparation was being made to better the same, by making a cross-cut from fire-clay rooms to head of main entry, which will, when completed, render the mine in fair condition. I was notified by superintendent a few days after this inspection that this cross-cut in question had been made and hoisting shaft re-timbered, and a part of ventilating shaft bratticed off for an escapement shaft.

Mine well drained; roof good; coal worked long-wall.

Henry Oldham.—Mine located 6 miles northeast of Centralia; shaft 32 feet deep; horse power; operated for local consumption.

Vandalia Coal company.—Wm. Beavan, president, and D. L. Stack, superintendent. This company is composed of miners. They own and are now operating three mines—two in Audrain county and one at Wellsville, Montgomery county.

The mine at Farber, Audrain county, is operated only for local consumption. The one at Vandalia is a new plant, located about $\frac{3}{4}$ of a mile west of Vandalia station; connected with the C. & A. railroad by a switch; shaft 76 feet deep; equipped with good machinery; tip-

house well arranged for convenience and economy, with 10 railroad chutes erected for coaling engines; mine ventilated by an 8-foot Crawford & McCrimmon fan, located at the top of hoisting shaft, one part of which is bratticed off and used as a ventilating shaft; coal is about 29 inches thick, and is being worked on the long-wall plan. Plant was erected at a cost of about \$9,000.

Mine operated by company last year at Vandalia was abandoned after the new one was put in operation.

BARTON COUNTY.

Coal is or has been worked in nearly every township in the county, but the most extensive mining is being done at Minden. Here the coal is found at a depth of from 45 to 80 feet below the surface, and is known as the Cherokee coal field. It varies from 34 to 40 inches in thickness. The coal at Liberal averages about 30 inches in thickness. It crops out around the hills, probably 25 or 30 feet above the railroad track. It is evidently a different seam from that which is being worked at Minden. Coal is also being worked by farmers and local operators for home consumption near Milford Irwin, Beloit, Hannon, Nashville and Lamar. At some of these places the coal is worked by strip-pits or quarries.

The coal product has shown a slight decrease during the year ending June 30, 1891, as compared with the report of 1890, but an increase in the value at the mine. The decrease in the output is attributed to the Western Coal and Mining Co.'s mine (one of the largest mines in the county) being idle. The increase is due to the many small local banks reporting the value of output at \$2.00, and even more, per ton. Thus it is that the average value per ton at the mine shows an increase from \$1.35 in 1890 to \$1.45 in 1891.

The following is a list of inspections made in this county:

LAMAR.

Henry Watman—Drift; located four miles south of Lamar; coal about 13 inches thick; pillar and room plan; operated for local consumption.

LIBERAL.

Liberal Coal company—Was operating two mines at date of inspection; both drifts; No. 1 connected with K. C., Ft. S. & M. R'y by a switch, and No. 2 connected with M. P. R'y, also by a switch. An air-shaft was sunk in No. 1 in October, 1890, but there were neither doors

nor brattice cloth on entries to control the air, and as a result the air was not being circulated around the mine as it should have been. Roadways were wet and muddy. This was caused by the falling of several rooms, allowing the surface water to pass into the mine. Mine No. 2 was also in bad condition; roadways wet and muddy and but little circulation of air. However, an air-shaft was being sunk near the working face, which I was told would be used for an escapement shaft also. Superintendent assured me that these deficiencies would be corrected as soon as possible, and as no complaints have been received from any of the employes, I have no doubt that the promise of the Superintendent was fulfilled.

Coal from these mines is consumed in Missouri, Kansas and Nebraska.

John Foot.—Mine located near Liberal; drift; operated in fall and winter for local consumption.

John G. Wilson.—Is operating a mine on William Sumpter's land; slope; coal 2 feet thick; worked pillar and room plan.

MILFORD.

J. W. Dixon.—Mine located near Milford; slope; coal about 18 inches thick; worked on the pillar and room plan.

W. H. Perry.—Mine located near Milford; shaft 12 feet deep; coal about 2 feet thick; worked pillar and room plan; operated for local consumption.

G. G. Ryan.—A small mine is being operated on Mr. Ryan's land for local trade; coal is about 24 inches thick; worked on the pillar and room plan.

MINDEN.

O. H. Morgan.—Mine located about one mile southwest of Minden; connected with the K. C., Ft. S. & M. R'y by a switch; mine was inspected November 21, 1890; at that date the work was confined to the north side of shaft; roadways were wet and muddy in places; I was told that the roadways were in worse condition than usual on account of recent rains and the draining of an abandoned part of the mine; ventilation produced by a furnace which was removing 7,000 cubic feet of air per minute; but the ventilation was found to be inadequate at head of the two inside entries and along the same rooms. This can be made much better by opening a brattice between 1st and 2d last entries, allowing the air to pass direct to the outlet, in place of ventilating these two old abandoned entries (1 and 2 east).

Mine superintendent, Mr. McClusky, commenced to remove the brattice between these entries as soon as his attention was called to

the matter. The system of blasting employed is by regular shot-firers, whose duty it is to fire all shots at night, after the employes have retired from the mine. This method seems to give general satisfaction. I have been notified since the above was written, that a 10-foot fan has been erected to take the place of the furnace.

Wear Coal Co.—A. B. Kirkwood, superintendent. Mine inspected Nov. 20, 1890. It is located about one half mile southwest of Minden; connected with the K. C. Ft. S., & M. Ry by a switch. This is a new mine, having been sunk during the past year; coal was struck July 1, 1890, at a depth of 43 feet. It is about 34 to 37 inches in thickness, and is known as the Cherokee seam. Mine is dry, water having to be taken from the surface to sprinkle roadways etc. The tip-house is well constructed for convenience and economy; hoisting is done by a pair of double engines, 45 horse power, connected to a 4½-foot drum; steam is generated by a 24-foot cylinder boiler. An air and escapement shaft was sunk immediately after the mine was put in operation, and a 10-foot W. E. Cole fan erected, which is of sufficient size to ventilate the mine properly. Mr. Kirkwood informed me that it was his intention to split the air into four currents, ventilating each part of the mine with a fresh current of air direct from the downcast. All cross entries are being driven double, and main entries have a return air-course on either side of them.

In a letter addressed to me under date of August 21, 1891, Mr. Kirkwood states:

We have an overcast 4x6 feet over main entry. Air goes direct to the face of each main entry and splits, one-half passing to the right, the other to the left, which gives us four separate and distinct currents; of course, as the mine progresses, and it becomes necessary, each of these currents can be split into two currents each. I find this system very satisfactory in its results, as we can greatly increase the volume of air without materially increasing the speed of the fan. We have built thirty-two dwelling houses here this summer, for our employes. The coal is consumed in Kansas, Nebraska, Indian territory and Missouri.

Western Coal and Mining Co.—A good steam plant, located near Minden, but has not been in operation during the past year. However, the mine is kept in constant repair, in order that it may be put in operation at any time without extra expense.

BATES COUNTY.

This county continues to lead in the production of coal. The center of the coal district is in the vicinity of Rich Hill. Coal is also mined at Foster, Worland, Amoret, Hume, Sprague and several other places in the county. The Missouri Pacific railroad passes through the coal fields from north to south, and the K. C., Ft. S. & M. and the K. C., N. & Ft. S. railways extend to the center of the coal fields, thus furnishing good shipping facilities.

The coal varies from 2 to 6 feet in thickness, and is worked on the pillar and room plan. In some places, however, it is found near the surface, and necessarily worked by stripping the dirt from over it and quarrying it out.

The report for the year ending June 30, 1890, shows that 671,373 tons of coal were produced, valued at \$713,039 at the mines; while this report shows an output of 726,273 tons, valued at \$762,740, an increase of 54,900 tons. The average value per ton at the mines decreased from \$1.06 in 1890 to \$1.05 in 1891.

Following is a description of each mine, with statement showing the condition of each at date of inspection:

AMORET.

Missouri Coal and Construction company.—Mr. Richard Gentry, general manager. Mine was sunk during the past year, and is located near Amoret, and connected with the K. C., N. & Ft. S. railway by a switch. At date of inspection, November 13, 1891, they had commenced the driving of entries and laying the foundation for the machinery and erecting tip-house. The mine was put in operation January, 1891. The coal was struck at a depth of 40 feet, and is about 2½ feet in thickness. Several tenant houses for employes have been built.

M. K. Martin.—Has a lease upon a portion of land lying about 1½ miles south of Amoret upon which he was opening a mine. He started the entry in a strip-pit that had been worked prior to this inspection.

RICH HILL.

Keith & Perry Coal company—John Perry, general manager, George Sweeney, superintendent; mine located about 4½ miles northwest of Rich Hill, and known as No. 5; is a shaft 70 feet deep, equipped with good machinery, etc. Two inspections were made during the past year, November 7, 1890, and April 3, 1891; on first inspection about 32,400 cubic feet of air were passing through the mine, measured near the out-

let, but on further examination it was found that it was not being properly conducted around the mine; air was not sufficient at head of a short entry, driven by Mr. Campbell, which was turned off of the fifth south, nor was it sufficient on entry known as "pigeon-hole," driven by Mooney & Cassidy. The attention of George Henry, mine boss, was called to the fact that there was a deficiency in air on both these entries, and he assured me that he would have the matter adjusted as soon as practicable. On second inspection, the ventilation was found much improved and in good condition; but the roadways were very wet and muddy in places, owing to the heavy rains that had fallen a few days prior to my inspection. Company has opened a mine south of Rich Hill, but as it is in Vernon county, is reported under that head.

W. W. Lucas—This mine was inspected November 8, 1891. It is located about two miles north of Rich Hill, at Ovid; connected with Missouri Pacific railway by a switch; the coal was first worked by a strip-pit, but later, a drift was driven in from it, and coal worked pillar and room plan. The mine was abandoned by Mr. Lucas early in the spring of 1891, after which it was operated by Woodson & Woodson until June, at which time it was abandoned. The last work was confined to drawing entry and room pillars.

Rich Hill Coal Mining company.—Major R. M. McDowell, general manager, and Joseph T. Reavley, superintendent. Mines located from one to five miles northwest of Rich Hill; connected with Mo. Pacific R'y by switches; coal is from 3 to 6 feet in thickness; worked on pillar and room plan. Pay for mining unscreened coal, 51½c per ton, and clean, merchantable coal 70c per ton. Coal is consumed in Missouri, Kansas and Nebraska. The output from these mines for the past year was a little over 508,000 tons of coal, including nut and run of mines

Mine No. 2.—Located one mile north of Rich Hill. George Maylen, mine boss. Shaft 32 feet deep; steam power; ventilated by a 10-foot fan.

Inspections were made November 10 and February 25. One measurement of air was taken near the up-cast shaft which showed 26,900 cubic feet, and another at the last break-through near head of first south entry, 2,100 feet from hoisting shaft, which showed about 10,000 cubic feet passing per minute. This fan also ventilated the mines operated by F. M. Martin and Burton & Chaney. These two mines employ about 25 men.

On second inspection it was found that the ventilating current was not being properly conducted through some of the rooms on the sixth north entry. The attention of the mining boss was directed to this fact, and he immediately put a man to work bratticing up the old break-

throughs, and also placing a brattice-cloth across entry to force air into and along the face of the rooms; with this exception, I found the mine in good condition.

About 140 men and boys are employed.

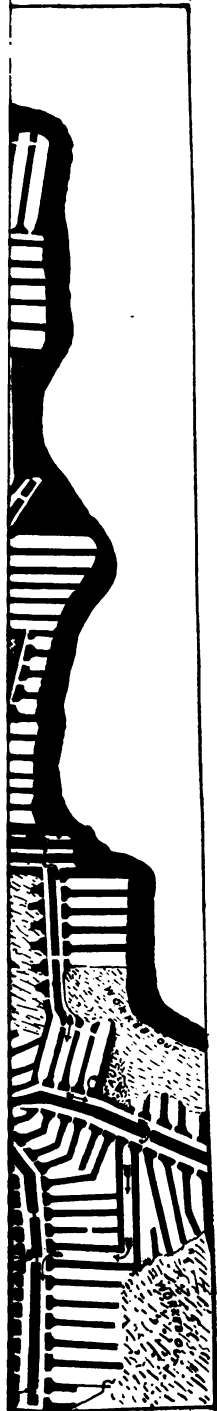
Mine No. 3.—Located three miles northwest of Rich Hill; operated by J. T. Weathers, administrator; J. B. Watson, mine boss. Inspection was made November 12, 1890. Coal is brought to the surface from two openings; ventilation produced by two fans; the one to the west is 8 feet in diameter and was removing 5,650 cubic feet of air per minute; the one ventilating the east slope is 10 feet in diameter, and was also giving good results. These two slopes give employment to about 100 men and boys. The coal averages about 4 feet 2 inches in thickness. Miners are paid 69c per ton for mining, but coal is required to be cleaned by miners before sending to the surface. However, it is sometimes loaded run of mine, or "rough and tumble," then miners are paid 51½c per ton.

Mine No. 4.—Operated by Thos. Graham, contractor; James Robertson, mine boss. Mine located about 2½ miles north of Rich Hill; ventilated by a 7-foot fan, which was, on date of inspection, removing 10,800 cubic feet of air per minute; drainage reasonably good; however, some water was on roadways in a few places.

From 35 to 50 men and boys are employed.

Mine No. 13.—Mine inspected November 6, 1890, April 25, 1891, and August 7. On first inspection the ventilation was being forced and circulated throughout the mine in reasonably good condition, with the exception of a few rooms on first south entry on east side. This deficiency was caused by a room falling and temporarily shutting off the air current; and also a few rooms on first east entry off of first south on west side of shaft, air was not being properly conducted to the workmen. The attention of Mr. John Graham, who was then mining boss, was called to these facts, and he was instructed to make the required improvements.

Second inspection: I found these deficiencies corrected, but air was not good on fourth north entry on east side. This was caused by brattice cloth being partly torn down between third and fourth north entry, but with these exceptions I found the mine in good condition. Measurements near the upcast shaft showed over 30,000 cubic feet of air passing per minute, but even with this amount of air, unless it is watched very carefully and stoppings examined often, a great deal of it will escape and find its way back to the upcast without reaching the employees. When the great quantity of powder used in this mine is considered, we are convinced that too much attention can not be given



to ventilation. In producing 150,516 tons of coal (run of mine during the past year), 6,533 kegs of powder were used, or only a little over 23 tons of coal produced for each keg of powder.

This is the most coal hoisted out of any one shaft in the State during the past year.

Mine No. 14.—Located about five miles northwest of Rich Hill; shaft 250 feet deep; machinery for hoisting, etc., in good condition; inspection was made November 3, 1890, and mine found also to be in good condition. Air measurement showed 41,100 cubic feet per minute, measured near outlet or upcast shaft, which was being forced and circulated through all parts of the mine. Considerable fire-damp is thrown off, but the excellent manner in which the mine was being ventilated rendered it harmless. In November the company opened one entry on the long wall, but it proved a complete failure on account of the gob or waste taking fire.

A Norwalk air compressor has recently been erected, and 12 Harrison mining machines put in, which, I am told, are proving to be a success. Stairway was rebuilt in escapement shaft in February. Mr. Alex. McKinnon is mining boss.

Mine No. 15.—New plant; located 2 miles south of Rich Hill; coal was struck December, 1890, at a depth of 106 feet; it is about 4 feet in thickness, and overlaid with a good shale roof; good machinery has been erected, and also a 10-foot ventilating fan, which sets at top of hoisting shaft, a part of which shaft is bratticed off and used for air chamber; several switches have been laid preparatory to loading different grades of coal. Tip-house well constructed, with revolving screens for cleaning coal.

Barton & Chaney, contractors—Slope; steam power; ventilated by the fan at No. 2; inspected November 10, and found in good condition; employing 11 miners and 5 day men at date of inspection.

F. M. Martin, contractor—Slope; adjoins No. 2 on the north, and is ventilated by fan at No. 2; mine inspected November 10, and found to be in good condition; 22 miners and 14 day men employed at date of inspection.

Simeon Jay, contractor—Drift; ventilated by a small furnace, large enough, however, for the number of men employed.

O. Spencer.—Mine located just north of city limits of Rich Hill; it was leased to Hines Brothers last fall, since which time it has been operated by them; coal is hauled to railroad in wagons.

J. M. Wise Coal company.—Mine located about 2½ miles northwest of Rich Hill; connected with the Missouri Pacific Ry. by a switch, tram road having been built from mine to railroad switch, a distance of one-half mile. Inspection was made November 7, 1890; the small ven-

tilating furnace was removing 6,400 cubic feet of air per minute, but an imperfect door was allowing the greater part of the air to return to the furnace without properly ventilating the part of the mine in which the miners were employed; this door was ordered repaired immediately. Since this inspection a new air-shaft has been sunk in a more convenient place, and a good chimney built over it. It employs from 30 to 40 men and boys.

Messrs. Woodson & Woodson.—Have opened a mine about $\frac{1}{2}$ mile south of city limits of Rich Hill, on Massie, Royce and Ferguson land, connected with the Missouri Pacific by a switch; an entry is being driven from an old strip-pit; coal from 4 to 4 feet 4 inches in thickness.

WORLAND.

Dr. A. L. Allen.—Mine leased to Raney and Wright; located near Ward's switch; coal 3 feet thick, and worked pillar and room plan.

Mr. N. Vaughn is also operating a small drift mine on Mr. Allen's land.

Western Coal and Mining company.—This company owns or has control of about 2,400 acres of coal lands lying in the vicinity of Worland and Foster, on the line of the St. L. & Emp. Div. of Mo. Pac. Ry.

Major R. M. McDowell general manager; general office St. Louis, Mo.

Mine No. 1.—J. Wilkins contractor; located at Ward's switch; coal is brought to the surface by horse power, up an incline; ventilation produced by a small furnace, which was giving good results at date of inspection, November 14, 1890. Drainage poor, caused by water overflowing the road from old strip-pits which adjoin the mine.

Mine No. 2.—Is a slope; located $\frac{1}{2}$ mile west of Worland; ventilated by a small furnace, which was not giving good results at date of inspection on account of a fall of slate on air-course, and which was obstructing the air passage; but this was only temporary, as efforts were being made to re-open the air-course. The main entry had been driven about 125 feet ahead of the last break-through: that is, the entry was 125 feet ahead of the air current, and rooms turned inside of the air current; the superintendent was notified to abandon such methods in future, which he assured me would be done. An effort was made to work the coal on the long-wall plan, but not proving successful, had to be abandoned.

Mine No. 3.—This mine was just being opened at date of inspection; two slopes were being opened; the machinery had just been erected, with pulleys arranged to hoist coal from either slope. Company were building several houses for employees.

BOONE COUNTY.

The coal output has increased from 21,302 tons in 1890 to 23,577 tons in 1891, while the average value at the mine has remained the same (\$1.46 per ton).

CENTRALIA.

Centralia Coal company—Mine located about $1\frac{1}{2}$ mile east of Centralia; operated by Messrs. Redfer & Edwards; shaft 35 feet deep; horse power; coal about 2 feet thick, worked on the long-wall plan; an air and escapement shaft has been sunk; coal used for home consumption.

G. M. Wiley—Mine located about 3 miles north of Centralia; shaft 30 feet deep; horse power; coal about 26 inches thick, worked long-wall.

W. A. Gooding Coal company—Mr. E. Morgan, mine boss; mine located about 4 miles north of Columbia; shaft 50 feet deep; horse power; an air and escapement shaft has been sunk during the past year; located in a very convenient place; mine operated for home consumption; from 6 to 25 men employed in and about mine.

D. W. B. Kurtz—Mine worked out and abandoned during the past year.

STURGEON.

D. A. Mayer & Bro.—Mine located about $2\frac{1}{2}$ miles south of Sturgeon; shaft 92 feet deep; horse power; coal 30 to 36 inches thick, and being opened on the pillar and room plan; the roof overlying it is of a very soft nature, requiring a great deal of timbering to keep it up; mine makes a great deal of water around the shaft bottom; coal used for local consumption.

COLUMBIA.

B. S. Benefiel—Mine located about $3\frac{1}{2}$ miles northeast of Columbia; employs from 2 to 8 men; operated for local consumption; coal 3 feet thick; worked pillar and room plan.

Columbia Coal company—Mine located about 5 miles north of Columbia; connected with the Columbia branch of the Wabash railroad by a switch; Mr. A. Rees, manager; shaft 112 feet deep; horse power; mine was opened and worked pillar and room plan until last year, since which time the plan has been changed to long wall, which is giving much better satisfaction. Under the pillar and room system they were

constantly troubled with gob fires, but since the long-wall plan has been adopted, but little trouble has been experienced from this cause. Roof overlying the coal is not good, but stands much better under the present system than when worked pillar and room plan.

Ventilation is produced by a large iron basket used in the upcast as a furnace; air was being forced and circulated around the mine in reasonably good condition. New cages and ropes have been put in during the year. Coal $3\frac{1}{2}$ feet thick; pay for mining, 80 cents per ton.

CALDWELL COUNTY.

During the past year, there have been produced in this county 22,661 tons of coal, valued at \$40,874.

The output for the fiscal year ending June 30, 1890, was 17,074 tons, valued at \$34,660, showing an increase of 5,587 tons, with an increased value of \$6,214 over last year.

HAMILTON.

Caldwell Coal company.—Mine located about $1\frac{1}{2}$ mile east of Hamilton; connected with Hannibal & St. Joseph railway by a switch; mine closed down in March, 1889, and was idle until December, 1890, at which time the company reorganized and commenced operations with E. B. Hayden as President and Wm. Hall Superintendent.

Inspections were made March 3 and June 30. On first inspection the work was confined to the first seam of coal, which is 360 feet below the surface, but as there were so many faults in the coal and it run so irregular, it was thought best to abandon this seam and open the one below, which they are now doing. The second seam is 147 feet below the first seam and 507 feet below the surface, being the deepest shaft in the State; coal is about 18 to 20 inches in thickness and overlaid with a hard slate roof; mine is being opened on the long-wall plan; machinery, cages, etc., in good condition.

Hamilton Coal company.—Mine located about $1\frac{1}{2}$ mile southeast of Hamilton; connected with H. & St. Joe R. R. by a switch; R. S. Cash, president, and Ralph Booth, secretary and manager; shaft 310 feet deep; ventilated by a 10-foot fan.

Inspections were made March 2 and June 30. On first inspection the mine was found in reasonably good condition, except the ventilation, which had been somewhat neglected in some parts of the workings. The attention of the mine boss was called to the deficiency of air, and he was instructed to have the matter attended to at once. The

trouble with the ventilation seems to be caused by small air-courses and the long distance the air has to travel. In some places the air is conducted along the old abandoned face of coal, and as the coal is worked long wall, the roof is necessarily settling and lessening the area of the air-course. This method of conducting air should be avoided as much as possible.

KINGSTON.

Kingston Coal company.—Mine located one mile north of Kingston. T. W. Hines, superintendent. Shaft is 240 feet deep and was sunk during the past year; coal was struck in May. The shaft is 6x15½ feet, divided into three compartments, two of which are to be used for cage-ways, the other for a ventilating chamber.

Coal varies in thickness from 10 to 26 inches; the latter seems to be the true thickness of the vein. It is evidently the same seam as that worked by the Hamilton Coal Co. at Hamilton, Mo.

The hoisting engines will be put in as soon as practicable; switch was being graded to make connection with the Hamilton and Kingston R. R. Date of inspection, June 30, 1891.

CALLAWAY COUNTY.

During the past year 15,581 tons of coal were produced in this county, valued at \$24,977.

The report of 1890 shows an output of 18,355 tons, valued at \$30,517, thus showing a decrease in output during the past year of 2,874 tons.

FULTON.

Wm. Castle—Mine located ¼ of a mile southeast of Fulton; not in operation at date of inspection (May 28, 1891), but an air-shaft was being sunk.

R. Bishop—Mine located near Fulton; coal from two to two and one-half feet thick and worked pillar and room plan; employ from four to six men.

A. Harris & Bro.—Mine located about 1½ mile west of Fulton; connected with south branch of C. & A. railroad by a switch; inspections were made May 28 and 29. Ventilation is produced by a small furnace. Coal is about 30 inches thick, worked pillar and room plan. Overlying the coal is a very soft shale roof, which causes the miner and operator a great deal of trouble by extra timbering, etc.; even entries and air courses have to be cross-timbered. Drainage good; ventilation fair.

A. Holmes.—Is operating two mines near Fulton; the one worked by shaft is located $1\frac{1}{2}$ mile west of town on Dr. H. Howard's land. This mine was sunk last fall and coal was reached at a depth of 55 feet below the surface, and is about two and one-half feet thick. Ventilation was had at date of inspection, but an air-shaft was being sunk which was completed a few days later, according to a letter received from Mr. Holmes. Roof overlying the coal poor, requiring a great many timbers to make it secure. The other mine, which is worked through a drift, is located about $\frac{1}{2}$ mile southwest of town. Ventilation was being greatly neglected in this mine; in fact it seemed that the air-courses, etc., were receiving but little attention. Mr. Holmes was duly notified to clean out these air-courses and keep the ventilation up to the requirements of the law.

I was notified a few days after this inspection was made that the mine had been closed down temporarily.

John Harris.—Mine was not in operation at date of inspection and had not been for several days.

An escapement and air shaft has been sunk during the past year. Mr. Harris informed me that he was going to sink a shaft to a seam of fire-clay which underlies the coal, and operate it in connection with the coal mine.

R. Lemer.—Mine located $1\frac{1}{2}$ mile northwest of Fulton; coal two feet thick; worked long-wall.

James Smith.—Mine worked in fall and winter for home consumption; not in operation at date of inspection.

STEPHENS' STORE.

Wm. Guy.—Is operating a small mine for local consumption near Stephens' store; shaft 45 feet deep; horse power; coal about 3 feet thick.

William Oldham.—Shaft 40 feet deep; horse power; worked pillar and room plan; operated for local trade.

CLAY COUNTY.

Randolph Coal and Gas company.—P. C. Hutchinson, manager, M. Meredith, mine superintendent. Is a well-equipped steam plant, located at Randolph, with general office at Kansas City, Mo. Ventilation is produced by a 12-foot fan which sets at the top of hoisting-shaft, a part of which is bratticed off and used for the up-cast or ventilating chamber. Mine discharges some fire-damp, but not enough to cause any trouble, unless allowed to accumulate. Gas was found in two

places at date of inspection (Dec. 5), in small places in the roof, where the slate had been blown down and out of reach of the ventilating current, but not enough to do any damage to anyone. An examination is made every morning by the fire boss of every working place before anyone is allowed to enter the mine.

Coal 18 inches thick, worked long wall.

I found it necessary to take action in the courts against the officials of this company to compel them to sink an escapement shaft. As soon as the suit was filed against them they closed the mine, pending the result of the suit. The decision of the court will be found under head of litigation.

COOPER COUNTY.

Missouri Valley Coal & Mining company—Located about 4 miles west of Boonville; connected with the Boonville branch of Missouri Pacific railroad by a switch; A. P. Miller, manager. This deposit of coal has been worked for a number of years, supplying steamboats and local trade. Since the mine has had railroad connections, however, considerable coal has been shipped to market. It is a cannel coal, and used mostly in the manufacturing of gas.

A new shaft was sunk this spring, located about 200 feet north of the old one. The old plant is well equipped with machinery for a mine of this character; but a horse hoister was in use at the new mine at date of inspection. The deposit of coal is said to average about 14 feet in thickness.

James Mahaffey—Owns and is now preparing to put in operation the mine formerly known as the Missouri Cannel Coal company. The mine has been idle for the past two years; it is located 4 miles south of Boonville.

A. Palmberg—Is operating a mine near Bunceton; shaft 100 feet deep; horse-power; coal used to supply home market.

Reinhart Coal company—Mine located about 2½ miles east of Bunceton, with office of the company in Boonville; mine idle and has been for the past year.

DADE COUNTY.

Coal is being worked in the northwestern part of the county, but only for local consumption; it is from 24 to 30 inches in thickness. Following is a description of the principal mines now in operation:

SYLVANIA POSTOFFICE.

Andrew Leonard—Is opening a mine on James McGarvey's land; is a slope; mine not in operation at date of inspection, but a new pump was being put in, preparatory to commencing work; coal 30 inches thick; worked pillar and room plan.

Robert McCluey—Owns two mines—one operated by Mr. Allen, the other by Joseph Harwell; both are worked through slopes; the average thickness of coal is about 28 inches; worked pillar and room plan; mining is done in the fire-clay underlying the coal; mines were found to be in fair condition.

Jack Riley—Operating a mine on J. R. Seaton's land; slope; coal about 30 inches thick; worked pillar and room plan.

R. M. Sharp—Operating a mine on Mr. McComb's land; slope; coal about 30 inches thick; worked pillar and room plan; from 7 to 10 men are employed.

E. Zook—Mine located on Mr. S. McGarvey's land; slope; mine was inspected December 1, 1890, and found to be in good condition; coal is 30 inches thick; worked pillar and room plan.

Coal is also being mined by J. M. McArthur, Sherman Gilbert and Joseph Shoemaker and others.

GRUNDY COUNTY.

Grundy County Coal company—Mine located at Trenton; Mr. N. Shanklin, superintendent, and S. P. Speer, mining boss; steam plant; shaft 210 feet deep; ventilated by a ten-foot fan, which had been erected since my last inspection. The fan was giving much better results than the old one, but was not furnishing the amount of air that was needed, on account of small air-courses through which the ventilating current had to pass. This fact was reported to the superintendent and he immediately gave orders to the mine foreman to have air-courses cleaned out as I had suggested. Coal is about 18 inches thick; worked on the long-wall plan; roof overlaying the coal is good; mine well drained, and machinery in good condition.

A new mine is now being sunk by the company, located about $\frac{1}{2}$ mile southeast of Trenton; shaft is 7x15 feet in the clear. I have been notified, since this inspection was made, that the shaft has been completed, striking coal at 157 feet. It is about the same thickness as in the old shaft.

HENRY COUNTY.

The coal product of this county during the past year compares favorably with the report of 1890, which shows 127,281 tons were produced, valued at \$193,221 at the mines. This report shows an output of 144,139 tons, valued at \$211,834, an increase of 16,858 tons.

BROWNINGTON POSTOFFICE.

Blair Diamond mine—Operated by Thos. Coe & Co., shaft No. 2, connected with the K. C. S. railroad by a switch; mine was inspected November 26, 1890, and found to be in poor condition; ventilation was not being properly conducted around the mine, and, notwithstanding 10,240 cubic feet of air per minute was being forced through it, yet some rooms were not properly ventilated. Roadways were wet and muddy in places. The attention of Mr. Coe, the mining boss, was called to these facts, and he was requested to give the matter his immediate attention, which he promised to do at once. Machinery in fair condition; an air and escapement shaft was sunk during the past year, which is in good condition; roof good in that part of the mine which was then being worked.

Mine No. 1—Idle, and had been for the past year.

Mine No. 3—Located $3\frac{1}{2}$ miles south of Deepwater; shaft 45 feet deep; horse power; mine sunk in September; coal 3 feet thick; worked pillar and room plan; mine in good condition.

CALHOUN POSTOFFICE.

Baldwin & Fonda Coal company—Mine is located about 2 miles west of Calhoun and is known as the 'Gedney mine,' connected with the M., K. & T. railroad by a switch; Harry Baldwin, manager, and N. H. Watson, mine boss; mine was inspected November 25, and found to be in good condition, much better in fact than at any previous inspection.

The only suggestion I saw fit to make was the removing of the ventilating furnace, which was located too near the bottom of the hoisting shaft; and in due time Mr. Baldwin notified me that the furnace

had been moved and rebuilt as suggested. Coal 30 inches thick; worked long-wall plan; drainage good.

Since the above was written, the engine-house, coal chutes and tip-house have been destroyed by fire. I am informed that the plant will be rebuilt as soon as practicable.

CLINTON POSTOFFICE.

H. H. Bodi—Is operating a mine on R. C. McBeth's land; shaft 33 feet deep; horse power; coal is about 3 feet thick; worked on the long-wall plan; from 7 to 12 men are employed; coal used for home consumption.

B. L. Owen—Mine located near Clinton; is a shaft 25 feet deep; coal about 24 inches thick; worked pillar and room plan.

DEEPWATER POSTOFFICE.

S. T. Callaway—Mine located on Hagman & Eaton's land; shaft 46 feet deep, horse power; 6 men are employed.

Hobbs & White—Operating a strip-pit and slope; located near Deepwater.

J. W. Hurst—Slope; located 3 miles south of Deepwater on Mr. Eaton's land; coal 30 inches thick; worked pillar and room plan. Inspection was made November 26, 1890, and mine found to be in good condition.

Kay Coal company—This company is operating several strip-pits in the vicinity of Deepwater. Coal is consumed in Missouri and Kansas.

McFadden & Eaton—Mine located about 3 miles south of Deepwater; slope; coal 3 feet thick and worked on the pillar and room plan; employs from 5 to 15 miners.

Keith & Perry Coal company—Mine located near Deepwater; connected with the K. C., Ft. S. & M. railroad by a switch. John Perry, general manager, John Patterson, superintendent, and Robt. Barr, mining boss; general office of company at Kansas City. Mine was inspected November 28, 1890. It is a steam plant, well equipped with good machinery; ventilation is produced by a 10-foot fan, which was forcing and circulating 13,800 cubic feet of air through the mine per minute. The mine heats in some places, but this is probably caused by taking up the fire-clay on roadways to give additional height for the passage of mules. I am told by Mr. Barr that they are usually troubled by the gob heating where the bottom is disturbed. Cages have been rebuilt and roadways much improved.

May 8, 1891, the tip-house took fire while the miners were at dinner and burned down. There were a number of miners in the mine at the time, but fortunately they were all rescued without being injured. The tip-house was rebuilt and a 14 foot fan erected, which Mr. Paterson, the superintendent, writes me is giving good results, removing 20,000 cubic feet of air per minute. Tip-house completed and miners put to work June 29.

This is the largest mine in the county. It gives employment to 100 to 130 men and boys. It is worked on the long wall-plan.

LEWIS STATION POSTOFFICE.

Co-operative Coal company—J. N. Johnson, superintendent. Mine located half mile west of Lewis station; connected with M. K. & T. R. R. by a switch; the coal was struck in this mine October, 1890, at a depth of 75 feet; a drill-hole was put down 102 feet in the bottom of shaft, and struck a flow of natural gas, which was being piped to the engine-house and used for lighting purposes; ventilation is produced by an 8-foot fan.

D. B. Pigg Coal & M. company—Coal about 2½ feet thick; worked on the long-wall plan; it is brought to the surface through a drift; ventilation is produced by a small furnace; coal is hauled to the M. K. & T. R. R. switch on a tram-road, a distance of about half a mile; mine idle at date of inspection, November 25, 1890.

Tobo Coal company—Mine located 1½ mile east of Lewis station; connected with the M. K. & T. R. R. by a switch; R. Bowen, superintendent, and H. Peckenpaugh, mine boss; ventilation is produced by a small furnace, but fire is used only in furnace on warm days, or when natural ventilation is not sufficient; mine has only been in operation a little over a year, therefore the under-ground workings are not very extensive; coal is about 30 inches thick; worked on the long-wall plan.

NORTH POSTOFFICE.

H. T. Noble—Mine located 1½ mile west of North station; is known as Fairview mine; horse power; coal worked pillar and room plan; operated for home consumption.

Woods & North Coal company—Mine located at North; connected with the K. C., Ft. S. & M. R. R. by switch; C. E. Bloom is mine superintendent.

A new shaft has been sunk by the company about one-fourth of a mile south of the old one; as the coal dips to the southwest, the new

shaft was sunk for the double purpose of securing natural drainage and economy in the keeping up road-ways, the coal being so near the shaft bottom.

Tip-house and machinery was in process of erection at date of inspection.

JOHNSON COUNTY.

This is one of the few counties in the State that has shown a decrease during the past year in the coal output, as compared with the report of 1890. In 1890 the output was 13,187 tons, while this report shows 10,530 tons, a decrease of 2,657 tons.

Following is a partial description of each mine.

KNOB NOSTEE POSTOFFICE.

T. H. Boyd & Son.—Mine located one mile southwest of Knob noster. Connected with the Mo. P. railroad by a switch. Inspection was made December 18, 1890. The machinery was found to be in fair condition, but there were no safety catches on cages nor gates around shaft top as required by law, and the rope on west cage was nearly worn out, but no one was allowed to go up or down on this cage. Ventilation is produced by a small furnace; doors and brattices were being erected preparatory to a change in the air current. This change will undoubtedly make a great improvement when complete. Mr. Boyd writes me (since this inspection was made) that safety catches, new rope and gates around shaft top had been put in, as I had suggested.

MONTSERRAT POSTOFFICE.

David Bullock.—Mine located about 5 miles south of Montserrat. Coal is about 28 inches thick, and worked on the pillar and room plan. Pay for mining $3\frac{1}{2}$ cents per bushel; 6 miners are employed.

John Harden.—Mine located about 5 miles south of Montserrat, on G. H. Sacks' land. Mine operated for local consumption.

George W. Hare.—Operating a small mine on Mr. Boyd's land; drift; coal 28 to 30 inches thick; 5 hands were employed at date of inspection.

P. Lamb.—Located $5\frac{1}{2}$ miles south of Montserrat, on Andrew Mack's land; coal 28 to 30 inches thick, and worked on pillar and room plan; 4 to 6 men are employed.

A. W. McCray.—Mine located on Mrs. Daley's land; drift; coal 30 inches thick; worked pillar and room plan.

Joseph Murley.—Mines located about 5 miles south of Montserrat; one is a shaft 30 feet deep, ventilated from an old drift; the other is a drift, and well ventilated; coal in each mine is about 30 inches thick; worked on the pillar and room plan. Most of this coal is used for home consumption. Some, however, is shipped by rail to points along the Missouri Pacific railroad.

WARRENSBURG POSTOFFICE.

Henry Baldwin.—Mine operated by Mike Staley; located about 2½ miles north of Warrensburg; coal about 18 inches thick; used for home consumption.

J. H. Christopher.—Mine located at Pertle Springs; coal 18 inches thick; employs from 2 to 5 men.

John B. Evans.—Mine located one-half mile west of Warrensburg; operated by Lewis Schrickler; coal about 18 to 20 inches thick.

John A. Henry.—Mines located about 2 miles northeast of Warrensburg; one is operated by himself and the other by M. B. Miley; both are drifts; coal 18 inches thick; worked on the pillar and room plan; coal consumed by farmers and in Warrensburg's mills. Both mines were found to be in good condition.

Wm. Phillips.—Mine located on the Milliken estate; coal about 18 inches thick; operated in fall and winter for home consumption.

Electric Light company.—Mine located at Pertle Springs; coal is about 18 inches thick, and is used exclusively by the electric light company; from 4 to 6 miners are employed.

B. F. Wood.—Mine located near Warrensburg; coal worked pillar and room plan; employs from 4 to 11 men; mine operated for home consumption.

G. H. Sack.—Owns some 480 acres of land lying 5 to 6 miles south of Montserrat, upon which George W. Hare and Joseph Murley's mines are located.

LAFAYETTE COUNTY.

This is the third coal-producing county of the State. Its close proximity to Kansas City gives its operators the advantage over competitors in some other counties in the short haul to market.

There have been 48 mines reported in this county as producing coal during the past year, but some of them are very small and are only worked in fall and winter for local consumption. These 48 mines report an output of 352,603 tons, with a value at the mines of \$545,551.

The report of 1890 shows the output from 36 mines to have been 329,845 tons, valued at \$508,743. This shows for past year an increase over the county's output in 1890 of 22,758 tons.

AULLVILLE POSTOFFICE.

Fitzgerald, S. J.—Drift; located 1 mile west of town; worked in fall and winter for home consumption.

Graham, Robert—Mine located 1 mile west of Aullville. Coal 20 inches thick; worked long-wall plan.

CONCORDIA POSTOFFICE.

Ellings, Henry.—Shaft 30 feet deep; horse power; located 3 miles west of Concordia. Mine was not in operation at date of inspection, nor was it expected to start work until fall.

Kresse, A. F.—Mine located about 4 miles southwest of Concordia; operated in fall and winter for home consumption.

Schult, John.—Mine located about $4\frac{1}{2}$ miles west of Concordia; operated for home consumption.

CORDER POSTOFFICE.

Corder Coal & Coke company.—H. G. Smith, superintendent, and W. E. Pemberton, mining boss; mine located at Corder; connected with the C. & A. R. R. by a switch; shaft 100 feet deep; machinery in fair condition; ventilation produced by an 8-foot fan. Inspection was made April 1, 1891, and everything in and about the mine was found to be in reasonably good condition; a small amount of water, however, was lying at face of coal on west side of shaft, but it was kept out as far as practicable. The coal is worked in a circle and is brought to the bottom through four main entries. The circle, or face, is nearly $1\frac{1}{2}$ mile around, but only about three-fourths of a mile of face was being worked, on account of the market not warranting full capacity. However, I was informed that the demand for coal had been good during the past year.

McCarty, Mrs. C. T.—Mine located $1\frac{1}{2}$ mile northwest of Corder; shaft, 22 feet deep; horse power; coal used for local consumption.

DOVER POSTOFFICE.

Dover Coal company.—T. Davis, Lexington, president, and V. R. Boyle mine superintendent; mine located 1 mile east of Dover station; connected by switche with the Boonville branch of the Mo. P. R. R. The air-shaft, which was sunk in 1890, was furnishing a sufficient quantity of air for the number of men employed; roof over roadways is not

good: that is, it requires careful timbering, but it is reasonably good at working face; roadways are wet and muddy, but there is very little water at working face. Inspection was made May 13, 1891.

Spruvel, T. F.—Mine located about $2\frac{1}{2}$ miles northeast of Dover; drift; coal consumed by steamboats and local trade. J. H. Miller, mining boss.

HIGGINSVILLE POSTOFFICE.

Bolen Coal company.—This property was formerly known as the "Farmer Coal company," but sold to the present owners in November, 1890, since which time it has been operated by them. The mines are located from 1 to $1\frac{1}{2}$ mile southwest of Higginsville; connected with the C. & A. railroad by a switch. C. V. Dean, mine superintendent. Mines were inspected May 6, 1891, but at that time but little work was being done. Coal is worked from three shafts, Nos. 1, 2 and 3. Nos. 1 and 2 are horse powers; No. 3 is operated by steam. Coal is about 18 inches thick and overlaid with a splendid roof, which requires but little timbering; in fact, timbers are rarely ever used along the face, as the draw-slate which comes down with the coal is used to support the roof, by building cogs along the face. The hoisting apparatus was in poor condition; they seem to have been greatly neglected by the former owner. I was informed by the company's agent that all necessary improvements would be made so as to comply strictly with the mining law as soon as practicable.

Bonanza Coal company.—S. W. Brandaw, superintendent; Joseph Barney, mining boss. Mine located $1\frac{1}{2}$ mile east of Higginsville; connected with the C. & A. R. R. by a switch, this switch having been put in during the past year.

Inspection was made April 7 and mine found to be in fair condition; the air and escapement shaft, which was sunk last fall, is in good condition and conveniently located.

Bruce & Knoble Coal company.—J. D. Bruce, manager. Mine located $1\frac{1}{2}$ mile southwest of Higginsville; connected with C. & A. R. R. by switch; ventilation produced by a small furnace which was giving reasonably good results; coal consumed in Kansas City—it is a good domestic fuel.

Excelsior Coal & Coke company.—Mine located about one-half mile west of Higginsville; connected with C. & A. R. R. by a switch; J. H. Campbell, superintendent, and Wm. Pinckney, mining boss.

Mine was inspected March 31, 1891, and found to be in much better condition than it was on previous inspections. The ventilating fan which had been erected was giving entire satisfaction. The air is con-

ducted from bottom of hoisting shaft to the face up the north entry ; at the working face it splits, one part going to the right and the other to the left, and is conducted around the working face to the main south entry, where it meets, and passes down the main south entry to air shaft, where it is discharged by the fan. Drainage reasonably good ; the only wet place that was being worked was on the east breast ; here a small quantity of water lies along the face, but it was kept drained as well as possible by a pump.

Coal is about 17 inches thick ; worked on the long-wall plan. Pay for mining from $3\frac{1}{2}c$ to $4\frac{1}{2}c$ per bushel, according to the place in which the miner is working ; a difference is also made where the miner pushes his own coal.

Gunn Coal company.—Mine connected with C. & A. R. R. by a switch : drift ; located $1\frac{1}{2}$ mile southwest of Higginsville ; it was idle at date of my visit, hence no inspection was made. Most of the coal is consumed in Kansas City.

Hagood Coal company.—Mine located $1\frac{1}{2}$ mile southwest of Higginsville ; J. E. Gunn, manager ; ventilated by a small furnace, which was giving fair results at date of inspection ; drainage good ; a switch connects the mine with C. & A. railroad.

Hawkins & Smith.—Mine operated by J. E. Wilks ; located about $\frac{1}{4}$ of a mile west of Higginsville ; shaft 80 feet deep ; horse power ; ventilated by a small furnace, which is situated near the bottom of hoisting shaft ; it was giving good results at date of inspection (March 31, 1891). An escapement shaft was sunk during the past year.

Jackson & Taggart Coal company.—Located $2\frac{1}{2}$ miles south of Higginsville ; an air and escapement shaft was sunk during the past year ; mine in good condition ; coal is hauled to town in wagons.

Republican mine.—H. S. Fraeschle, manager ; situated near Higginsville ; shaft 25 feet deep ; horse power ; operated in fall and winter for home consumption.

Rocky Branch Coal company.—M. L. Belt, manager ; mine located about $1\frac{1}{2}$ mile southwest of Higginsville ; connected with C. & A. railroad by a switch ; the company have graded a switch to connect these mines with the Mo. P. railroad, but as yet no connection has been made. But little coal has been shipped during the past year, on account of the small demand for it ; they were not in operation at date of visit ; therefore no inspection was made of inside workings.

Schafer, Charles.—Mine located about 2 miles east of town ; operated by E. Hoffman ; coal used for home consumption.

Stealy & Fowler Coal company.—T. J. Fowler, manager ; company is operating two mines, both of which are connected with the C. & A.

railroad by switches; No. 1 was inspected May 6, 1891; I discovered that the ventilation was not sufficient, and on making an examination, I found that the ventilating shaft had partly closed in, thereby obstructing the air-course. The superintendent's attention was called to this and he was notified to have the air-shaft cleaned out at once. No. 2 is also ventilated by a small furnace, which was giving good results. Both mines were well drained and otherwise in reasonably good condition.

The principal part of this coal is consumed in Kansas City. It is a good coal and highly recommended as a domestic fuel.

John W. Tate.—Located at Higginsville; mine was formerly known as "Mason coal mine;" horse-power; shaft 44 feet deep; mine is now closed down.

Winsor Coal company.—H. W. Winsor, manager; Thos. Thomas, mine boss; located 2 miles west of Higginsville; connected with C. & A. R. R. by a switch; mine was inspected March 31, 1891, and found to be well ventilated and in good condition. It has only been in operation about one-half time during the past year; this was caused by the small demand for the coal.

The principal market is Kansas City; pay for mining $87\frac{1}{2}$ per ton in summer and \$1.06 $\frac{1}{4}$ per ton in winter; 40 to 90 men and boys employed, according to the demand for coal.

LEXINGTON POSTOFFICE.

Bell O Greer.—Mine located about $\frac{1}{4}$ of a mile southwest of Lexington; operated for local consumption only.

Clark, Thomas.—Drift; located about a half mile east of Lexington; mine has been idle for the past two years, but is now being reopened preparatory to again commencing operations.

Kelly Coal company.—T. G. Kelley manager; slope; mine idle at date of inspection, caused by fire on the night of May 7, destroying chimney over air-shaft, and also burning down wind pump; coal used for home consumption.

Kist, Joseph.—Drift; located about $\frac{1}{4}$ of a mile southeast of Lexington; employs from 2 to 8 men.

Lafayette Coal company.—W. F. Kerdolff manager; mine located about $4\frac{1}{2}$ miles east of Lexington; connected with the Mo. P. R. R. by a switch; inspection was made May 13, 1891; ventilation produced by a small furnace which was inadequate; I so informed Mr. Kerdolff, who promised to either increase the size of the furnace or sink a new air-shaft in a more convenient place and erect a new furnace, either of which will be satisfactory; an opening was made, connecting the east

face with an old drift, through which the air was being conducted; by this connection about 500 feet of very small air-course was cut off; roadways were wet and muddy, but comparatively dry at face of coal; the roof not good on roadways but good at working face, and appeared to be getting better as the work advanced into the hill.

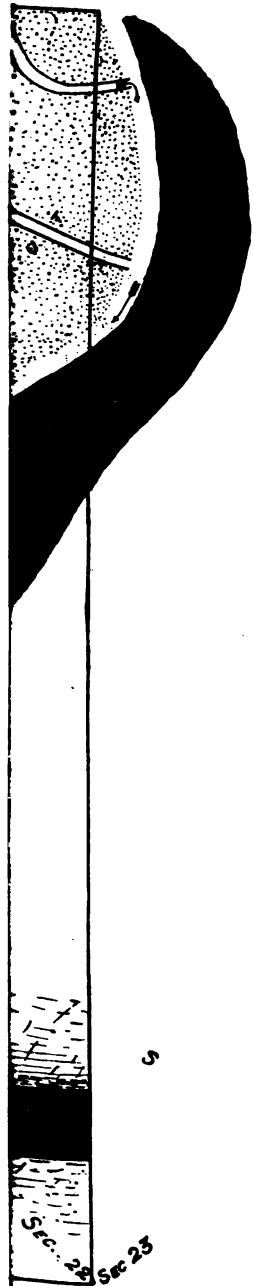
Lexington Coal Mining company.—Mr. M. W. Serat, superintendent. This company is operating several mines in the vicinity of Lexington, all of which are connected with the Mo. P. R. R. by switches. All of the openings are drift except one, which is a shaft 45 feet deep; this was put in operation during the past year; pay for mining, 4 cents per bushel in summer, and $4\frac{1}{2}$ in winter at mines where the miner delivers the coal at weigh office or bottom of shaft, but where company employs mules to haul the coal from the miner, $3\frac{1}{2}$ cents are paid for mining in summer and 4 cents in winter; coal is from 18 to 22 inches thick, and worked on the long-wall plan. It is consumed in Missouri, Kansas and Nebraska.

Following is a brief description of each mine, showing the condition of each at date of inspection:

Graddy mine.—Situating probably $2\frac{1}{2}$ miles west of Lexington; drift; ventilated by a furnace which had recently been erected to take the place of the old one; I found, on date of inspection, that it was not producing the amount of air required by law; I suggested to the superintendent that an additional section be added to the chimney over the furnace shaft, in order to give greater draught to the furnace; a few days afterward the additional section was added to the air chimney as suggested. Roof good; roadways dry and in good condition.

McDowell mine.—Shaft 45 feet deep; steam power; mine was put in operation about the first of May, 1890; it is equipped with good machinery of sufficient capacity for a plant of this character; the bottom is well laid off, with three tracks leading from the shaft, and all of these tracks extend up the main entry for a considerable distance; the coal is probably the thickest in the county; in places it is found to be nearly 24 inches in thickness, with a general average of about 22 inches. A 10-foot fan has been erected, which is giving good results; roof, roadways, etc., in good condition.

Riverton mine No. 1.—Located about $1\frac{1}{2}$ mile east of Lexington, and No. 2 about $\frac{1}{4}$ of a mile east of No. 1; both mines are connected and ventilated by the same furnace, which is located in No. 1, on the first east entry; the air enters each mine, and is conducted around the face of coal to first east entry in No. 1; here it meets and is conducted to the furnace in one volume. Roof and roadways are in good condition in Mine No. 1, but the roof is not good in a part of No. 2; this is



probably caused by the working face approaching the crop. I was informed by Mr. Peter Nord, the mining boss, that this mine would probably be worked out during the next year.

Hacket and Seawell mines were both idle at date of inspection (May, 1891), and had been since February, hence it was I did not make an inspection of either of them.

Henry Macey.—Mine located about 2 miles west of Lexington; connected with Missouri Pacific by a switch.

Inspection was made May 8, 1891, and it was found that a sufficient amount of air was not being forced through the mine. This deficiency was caused by an inadequate ventilating furnace.

The old ventilating shaft fell in during the month of April, 1891, and in order to keep the mine in operation, a small furnace was erected at the mouth of an old drift, and a chimney erected over it, which was in use at date of inspection. Mr. Macey was notified of this deficiency in air, and requested to have the ventilating current increased, so as to comply with the law. Roof, and roadways good; mine well drained.

J. C. McGrew.—Owns two mines, located about 3½ miles west of Lexington; connected with Mo. P. R'y by switches.

Mines are usually idle during the summer months, but work full capacity in winter; the only work being done at date of inspection, May 11, 1891, was taking up bottom on roadways preparatory to starting operations when the fall trade opened up.

Both mines are ventilated by small furnaces.

Coal consumed in Missouri and Nebraska.

Mine No. 3 is still idle.

Morrison Bros.—Mine located about 2 miles west of Lexington; drift; employs from three to nine men; coal used for home consumption.

O'Maley, Andrew.—Mine located ¼ of a mile southwest of Lexington; shaft 25 feet deep; horse power; ventilated by a small furnace, which was giving good results at date of inspection (May 8, 1891); drainage good.

Watton, Thos.—Mine located about ½ mile east of Lexington; ventilation was produced by a small furnace, which was giving poor results at date of inspection (May 9, 1891), owing to the long distance the air had to travel and the resistance encountered by the many small places in air-course; I was informed that a connection would soon be made with an old drift, which will increase the air current to the requirements of law; from six to ten men employed; coal mined for local trade.

MAYVIEW POSTOFFICE.

L. A. Gasaway—Mine located about $\frac{1}{4}$ of a mile east of Mayview; connected with the C. & A. railroad by a switch. This was formerly known as Strasburg & Son's mine, but was leased to Mr. Gasaway in October, 1890, since which time it has been operated by him. Since Mr. Gasaway took charge, he has raised the platform at top of shaft and erected a weigh office. Ventilation is produced by a small furnace, which was, on date of inspection, giving good results; drainage good; mine in fair condition; W. W. Frazier is mining boss.

NAPOLEON POSTOFFICE.

Missouri River Coal Mining company—J. B. Silvers, superintendent; connected with Mo. P. railroad by a switch; shaft 61 feet deep; hoisting is now being done with a horse, but the superintendent informs me that a steam plant is soon to be erected.

The roof leaks in many places, which makes roadways, etc., very wet and muddy. Doubtless the water will disappear as the working face approaches the bluff back of the shaft. In fact, but little water is to be seen now along the face of coals which has reached the main part of the hill. A furnace is used to ventilate the mine, and is giving good results.

An escapement shaft was sunk during the past year, which is conveniently located and in good condition.

Napoleon Coal and Mining company—J. H. Duffendack, superintendent; mine located 1 mile east of Napoleon; connected with the Missouri Pacific railroad by a switch. Inspection was made May 12, 1891. At this date, they were shooting down the roof in the mine and making better roadways, preparatory to doing a larger business when the fall trade should commence.

Ventilation produced by a furnace.

WATERLOO POSTOFFICE.

Hartman & Gilbert Coal Mining company—Mine located $\frac{1}{4}$ of a mile east of Waterloo; connected with Missouri Pacific railroad by a switch. Inspections were made May 12, 1891, and June 25, and mine found in fair condition on both inspections. Ventilation is produced by a furnace. The fire in furnace had been allowed to go out on idle days and Sundays, and of course a great deal of black damp accumulated in consequence; but when fire is kept in furnace, ventilation is reasonably good. Mr. Gordon, mining boss, lost his life on the 15th of June, by being overcome with black damp. From the evidence collected, it

seems that Mr. Gordon went into the mine on the morning of the 15th to start the fire in the furnace, which had not been kept burning for two or three days, during which time the mine had been idle, and while trying to light the fire, he was overcome with the foul air. See report of accident elsewhere.

WELLINGTON POSTOFFICE.

Carter, Andrew—Mine located near Wellington; drift; but little work had been done during the past year; all coal mined has been used by local consumers. Only 2 or 3 men employed at date of inspection.

J. M. Seawell & Co.—Mine located 1½ mile west of Wellington, connected with Missouri Pacific railroad by a switch. It seems to be somewhat neglected by its owners. The ventilating shaft is separated from the main hoisting shaft by a wooden brattice work, which is old and leaking, hence a great deal of the air returns to the surface without circulating to the workmen. Notwithstanding this waste, however, the ventilation was reasonably good at date of inspection (May 12, 1891), but I am of the opinion that it is not good at all times. The superintendent, Mr. S. C. Archer, was duly notified that the ventilating and hoisting shaft must be put in proper condition as soon as practicable. Escapement shaft in good condition. Coal consumed in Kansas City, Mo.

Wellington Coal company—Mine located at Wellington; connected with the Missouri Pacific railroad by a switch. An inspection of the mine was made May 11, and found to be fairly well drained and in good condition, except an escapement, shaft which the law requires. The mine had closed down a few days prior to this inspection for the summer, but as it would be put in operation again before another inspection could be made, I deemed it my duty to notify the company to have an escapement shaft made before commencing operation again, and at the same time suggested that a part of the ventilating shaft be bratticed off, which is extra large and only about 35 or 40 feet deep; also to erect a ladder in it and make a roadway around the furnace at bottom, so that in event of an accident to main hoisting shaft the miners could pass out through this one; and in due time Mr. M. V. L. McClelland, vice-president of the company, wrote me that my request would be complied with immediately.

LINN COUNTY.

Coal is being worked at Marceline and in the vicinity of Brookfield. At the latter place it is worked only for home consumption. It is from 24 to 26 inches in thickness and worked on the long-wall plan. During the past year 28,036 tons of coal were mined, an increase over 1890 of 14,633 tons.

BROOKFIELD POSTOFFICE.

Clark, George.—Mine located $1\frac{1}{2}$ mile east of Brookfield; shaft 140 feet deep; horse power; inspection was made March 4, and mine found to be fairly well ventilated, but having been worked without fixed rules, the inside working was in poor condition. The protection around top of shaft and safety catches on cages, as required by law, were wanting. Mr. Clark was notified of this and requested to have the matter attended to at once.

House, H. W.—Mine located $1\frac{1}{2}$ mile east of Brookfield; shaft 140 feet deep; horse power; no gates around the top of shaft, nor safety catches on cages. I was promised that the gates around shaft and safety catches on cages would be attended to immediately. From 3 to 10 men employed.

Schaefer, B.—Mine located $2\frac{1}{2}$ miles east of Brookfield; shaft 150 feet deep; horse power; coal 24 to 26 inches thick; worked on the long-wall plan. This mine, like the others in this neighborhood, has no protection around the shaft; neither have they any safety catches on cages. Mr. Schaefer was duly notified to have these matters attended to at once. Mine worked in fall and winter for home consumption.

MARCELINE POSTOFFICE.

Kansas and Texas Coal company.—John R. Braidwood, superintendent, and George W. Kierstead, assistant superintendent. This mine is known as No. 32, and is connected with the Santa Fe railroad by a switch. Inspection was made March 3, and mine found to be in good condition. An escapement shaft has been sunk and supplied with ladders. It is also used as a ventilating shaft, the fan having been removed from the main hoisting shaft and erected over it. Ventilation has been much improved. The air is now split into four distinct currents, each part ventilating separate groups of employees. Price paid for mining was reduced March 1 from \$1.25 per ton to \$1. Miners accepted the reduction without trouble. Coal is about 25

inches thick and worked on the long-wall plan; from 70 to 90 men and boys are employed. The company have had some trouble with the employes in regard to the semi-monthly pay law which was enacted at the last session of the Legislature; but this will be referred to under the general heading of strikes.

MACON COUNTY.

This is the second coal producing county in the State. During the past year the output was 454,029 tons, valued at \$576,678; the report for 1890 shows an output of 457,896 tons, valued at \$585,925, thus showing a decrease of 3,865 tons and a decrease in value of \$9,247, for present year.

Following is a partial description of each mine, together with a statement as to the condition in which each was found at dates of inspection:

ARDMORE POSTOFFICE.

Kansas & Texas Coal company—Mr. B. F. Hobart, president, and John B. Braidwood, superintendent. This company owns and is operating a number of mines in this State, with general office at St. Louis, Missouri.

In January the company purchased the mining property in Macon county owned by Thos. E. Wardell, consisting of about 14,000 acres of coal land, including three shafts located at Bevier, for which I understand \$400,000 were paid. A great many improvemens have been made at the Ardmore and Bevier mines during the past year; chief among which are the erection of about 50 new dwelling houses at Ardmore and 21 at Mine No. 42 (Bevier). Two hundred new mining cars and about two miles of side-track and switches have been built at the Ardmore mines, and an additional shaft is being sunk by the company at Bevier. Coal ranges from $3\frac{1}{2}$ to $4\frac{1}{2}$ feet in thickness, and is worked on the pillar and room plan. Pay for mining 50 cents per ton, run of mine, at Ardmore, and 50 cents per ton in summer and 60 cents in winter at Bevier.

Following is a limited description of plants at each place, with a statement as to the condition in which they were found at dates of inspection:

Mine 26.—Was inspected February 20, and I found a great improvement since my last visit some of the roadways which were wet and muddy having been corduroyed and made comparatively dry; the

air-shaft, which was sunk June, 1890, has improved the ventilation a great deal; it is located near the head of main entry; a furnace was built near the bottom of it, which was removing 13,000 cubic feet of air per minute. J. P. Sneed, the mining boss, for reasons hereafter explained, was having miners turn rooms inside of the last break-through—that is, between the break-through and head of entry—and, of course, ahead of the air current. On calling the attention of Mr. Jones, mine superintendent, to the fact, he said: "A few days ago we closed down several of the contract mines and put the miners into the other mines in order to give them employment and keep them with the company, and in some cases we have had to put miners in ahead of the air current, but it is no common practice and will not be continued." With this exception I found the mine being operated strictly in compliance with the law.

Little 26 is a small opening, located 700 or 800 feet north of 26 proper. The opening was made to get a block of coal that had been left in No. 26. It is ventilated by a small furnace which is giving good results. The coal in this opening is probably thicker than in any other mine in the county; I measured several places which was nearly 5 feet; but the roof overlying it is poor and so bad in places that it is necessary to use cross-bars even in the rooms.

Mine 27—Was inspected February 21; Mr. Thomas, mining boss; the coal is brought to the surface from two openings, each of which is ventilated by a separate furnace; the furnace in the last opening was removing about 6,000 cubic feet of air per minute, the same being conducted and circulated to all parts of the mine. I was informed that one of the entries in this opening would soon connect with an entry from the other side of the hill. This connection will doubtless increase the air current, as it will lessen the distance it has to travel several hundred feet.

West side much improved; an air shaft sunk and a new ventilating furnace erected, which was producing about 9,000 cubic feet of air per minute, 2,500 cubic feet more than the old furnace was producing one year ago; roof fair; roadways good; drainage also good.

The Twin openings are also run in connection with No. 27. They are located 200 or 300 yards west of No. 27, proper. They were opened during the past year; ventilated by a small furnace, which was giving good results; mine well drained and in good condition.

Mine No. 33—Slope; opened during the past year. Inspection was made February 21. At that date ventilation was produced by a furnace, but since then a 12-foot ventilating fan has been erected.

The plant is well equipped with an elevator and revolving screens to make the different grades of coal. Mine well ventilated and in good condition; George Morris is mining boss.

There are also several small mines which were operated by contractors during the past winter, but they are now idle and have been for several months, hence it is not deemed necessary to make reports on them.

These contract mines are usually in operation during the winter months, and give employment to quite a number of men, but when the winter trade is over, the mines are closed down, and the miners put to work in the other company's mines, and as a result, the statistical report from the three mines at this place (Ardmore) shows more miners employed during the summer than in the winter, which is not the case at other mines in the State.

BEVIER POSTOFFICE.

Kansas & Texas Coal company, Mine No. 42.—Connected with the H. & St. Joe R. R. by a switch; this was formerly the property of Thos. E. Wardell, and was known as Mine No. 3; inspection was made March 10; it is ventilated by a 10-foot fan on the north side and by a furnace on the south side, neither of which was giving satisfaction, owing to the long distance the air had to travel and the many small places through which it had to pass; I was informed by the superintendent that the mine would be worked out and abandoned during the coming winter; all entries have been stopped, therefore the work is confined to driving rooms and drawing pillars; Charles Cavanaugh is mining boss.

Mine No. 43.—Located about 1½ miles southwest of Bevier; Augustus Prowser, mining boss; mine was formerly owned by Mr. Thos. E. Wardell, and known as Mine No. 4; coal is brought to the surface through a vertical shaft 115 feet deep, and hoisting is done by a pair of double engines, each of which is 11 x 20 inches in cylinders, connected direct to a drum 4 feet in diameter; the air and escapement shaft is conveniently located and well timbered; mine well drained and in good condition; inspection was made March 10.

Bevier Black Diamond Coal company.—W. S. Watson, manager; L. Bradford, mine superintendent. This mine was opened and put in operation during the past year. Located about 1½ mile southwest of Bevier; connected with H. & St. Joe R. R. by a switch.

Shaft 60 feet deep; 7x14 feet in the clear and well timbered; an air-shaft has also been sunk, and is 6x6 feet in the clear and well tim-

bered. The hoisting is done by a single engine, 10x20 inches in cylinder, drum 4 feet in diameter, the engine shaft being geared to the drum shaft 4 : 1.

Inspections were made March 9 and August 23, 1891, and mine found to be in reasonably good condition, although on last inspection some loose rocks were found along the main entries, which were ordered taken down, as I considered them unsafe for the employes to pass under.

Loomis & Snively Coal company.—W. H. Loomis, general manager, and Thos. Francis, superintendent.

This company own and operate three mines, located at Bevier, all of which are connected with the H. & St. Joe R. R. by switches.

The coal varies from $3\frac{1}{2}$ to $4\frac{1}{2}$ feet in thickness, and is worked on the double entry pillar and room plan; the roof overlying it is of reasonably good character for this district; but little powder is used by the miners, as most of them in mines Nos. 1 and 3 mine the coal before blasting it down, and nearly all the mining in No. 4 is done by machinery, hence but little powder is necessary. Pay for hand-mining unscreened coal (or run of mine), 50 cents per ton in summer and 60 cents in winter.

Following is a partial description of each plant, and the condition in which they were found at dates of inspection :

Mine No. 1.—Is a steam plant; shaft 60 feet deep; ventilated by 10-foot fan. Inspections were made March 7th and 9th. On the first inspection the fan was not giving good results on account of the fan engine being out of order; besides, there were many small places in air-courses which obstructed the air current. On second inspection measurements of air showed an average of 14,860 cubic feet passing per minute, measured near the foot of the down-cast, with the fan making from 115 to 120 revolutions per minute; roadways reasonably good.

Mine No. 3.—Steam plant; ventilation produced by a 10-foot fan, which was giving good results at date of inspection (March 9, 1891). Since the last inspection the old north entry has been abandoned and a new one opened near the bottom and to the south of main north entry, in which all the mining is being done at present. Mine in fair condition at date of inspection. Joseph Stott, mining boss.

Mine No. 4.—Steam plant; shaft 52 feet deep; mining is done by machinery, 8 or 10 Harrison mining machines being in use, and two Norwalk air compressors furnish the air for operating the machines. Mine is ventilated by a 12-foot fan, which was, on date of inspection, removing about 18,460 cubic feet of air per minute, measured near the foot of hoisting shaft. The fan engine has been changed, and is now con-

nected direct to fan shaft—thus doing away with the belt which was formerly used. I found that the first west entry on the south side and main south entry were both ahead of the air: that is, the entries were so far ahead of the air current that the ventilation was not good; but ventilation is reasonably good in all other parts of the mine; roadways are in fair condition, many places having been corduroyed and made comparatively dry, that otherwise would have been wet and muddy.

Oakdale Coal Co.—J. W. Atwell, president, and James R. Williams mining boss; mine located at Bevier; connected with Hannibal & St. Joe R. R. by a switch. I made an inspection of the mine, March 9, and found a deficiency of air. On making an examination of the air-course, we found that ice had accumulated in the bottom of the air-shaft; which had greatly obstructed the air, and was no doubt the cause of the difficulty. The mining boss had the ice removed at once, which greatly improved the ventilation.

Coal is worked on the double entry pillar and room plan; pay for mining unscreened coal (or run of mine) 50 cents per ton in summer and 60 cents in winter; machinery cages, etc., in fair condition.

Watson Coal and Mining company.—W. S. Watson, manager, and Wm. Rivers, mining boss; located at Bevier and connected with the H. & St. Joe R. R. by a switch; mine was inspected March 6; it is a steam plant, well equipped with good machinery etc.; ventilation is produced by a 10-foot fan, which was, on date of inspection, removing 13,000 cubic feet of air per minute, measured near the bottom of shaft, which was being forced and circulated to all parts of the mine as far as practicable in this kind of work (pillar and room). Mr. Rivers seems to take every possible advantage in the ventilation of the mine, by securing air-courses from one cross entry to another, in order that the air may have the most direct route to the workmen. He had just opened an air passage between the 7th and 9th east entry, through which the air current was passing; this change shortened the distance the air had to travel nearly 1,800 feet, greatly improving ventilation.

Prior to this inspection, the work was confined to the north side of hoisting shaft, but the south side is now being opened, and as no practicable roadway was furnished around the shaft bottom, I notified Mr. Watson to have one made as soon as possible, and in due time the following letter was received, which explains itself:

BEVIER, Mo., March 20, 1891.

C. C. WOODSON, Esq., *State Mine Inspector, Jefferson City, Mo.:*

DEAR SIR—In accordance with your request on your last visit here, we have made a good place at the bottom of our shaft for men to pass to either side without going under cages, and it will be kept in that shape.

Yours truly,
W. S. WATSON.

LINGO POSTOFFICE.

Little Pittsburg Coal company.—A. G. French, manager, and C. A. Parker, mining boss. Mine located at Lingo, and connected with the H. & St. Joe R. R. by a switch. Inspection was made March 5, and we found a great improvement in the ventilation since last inspection. A deficiency of air was found only on one entry—the first east on the north side—but this entry was to be abandoned in a few days and the full force of the air directed to the face of the other part of the work; a measurement of the air current showed 7,500 cubic feet passing per minute, measured near the shaft bottom. Mine well drained; coal worked on the long-wall plan. Much improvement has been made about the mine during the past year; among other things 10 new dwelling houses have been built. Coal consumed at Kansas City, St. Joseph, and other points along the line of the H. & St. Joe R. R.

MACON POSTOFFICE.

Macon Coal company.—W. G. Walker, sup't. Mine located about $1\frac{1}{2}$ mile west of Macon; connected with H. & St. Joe R. R. by a switch. This property was formerly owned and operated by the Hillyer & Sterritt coal company, but in February, 1890, the mine was closed down under a mortgage and sold in August to some Macon parties. In December the mine was leased to the present company, since which time it has been in operation.

The shaft was sunk in 1888 to a depth of 180 feet, passing through three seams of bituminous coal; the first is about 80 feet below the surface, and is about 24 inches thick, and is the one which has been worked during the past year, but it is not giving satisfaction owing to the poor roof overlying it. The second seam is 112 feet below the surface, and is about 18 inches thick, overlaid with a black slate roof; an entry is now being driven in this seam to ascertain if it can be worked with profit. The third seam, 180 feet below the surface, varies a great deal in thickness; in some places it is $4\frac{1}{2}$ feet thick, separated by a stratum of fire-clay.

Inspections were made February 24 and August 22, and a lack of ventilation found on each inspection—not in all parts of the mine, however, but on first right hand entry, which was caused by imperfect brattices and air-courses.

Orders were given the mining boss to repair these brattices and clean out air courses immediately. On second inspection I found the company had changed mining bosses—Wm. Massey then occupying the position. He was making progress in bettering ventilation.

MILLER COUNTY.

Lewis Rusk—Mine located $2\frac{1}{2}$ miles west of Eldon. Coal lies in a trough, dipping to center at an angle of 12 to 20 degrees, and varies in thickness from 6 to 9 feet, separated by a band of fire-clay which runs from 10 to 14 inches in thickness; the stratum of coal underlying the fire-clay band is about 3 feet thick, and is said to be a good blacksmith coal; the stratum overlying the band of fire-clay is of an inferior quality, hence it is not worked. Coal used for home consumption.

MONTGOMERY COUNTY.

Henry Whitehead—Mine located about 1 mile south of Wellsville; shaft 20 feet deep; horse power; coal about 2 feet thick and worked on the pillar and room plan; it is used for home consumption.

Vandalia Coal company—W. J. Hughes, superintendent; mine located at Wellsville; connected with the Wabash railroad by a switch; machinery for hoisting was in good condition; ventilation is produced by a furnace, which is not large enough to produce the amount of air required, but since this inspection, the superintendent writes me that they have concluded to erect an 8-foot fan to take the place of the furnace. Coal about 30 inches thick; worked on the long-wall plan.

Company has erected several railroad chutes, and furnish a great deal of fuel to the railroad.

The superintendent has notified me since the above was written that an 8-foot fan had been erected to take the place of the furnace.

MONITEAU COUNTY.

Kansas-Missouri Mining and Improvement company—James M. Harvey, superintendent. This is known as the "Simpson bank," and located about 13 miles east of Versailles. The coal crops out near the county road. It dips to the south at an angle of 30 or 40 degrees for about 100 feet, then seems to lie nearly level. It has been worked along the out-crop for about 200 feet. Both cannel and bituminous coal are found, the latter overlying the former. It is said that in places the deposit is 30 feet in thickness. Lead and zinc ore are also found in the coal seams and in the clay overlying it. Coal is used for home consumption.

NODAWAY COUNTY.

A seam of bituminous coal is being worked in the western part of the county. The coal varies in thickness from 8 to 16 inches, and is worked on the long-wall plan. During the past year 2,222 tons of coal were produced, valued at \$5,504 at the mines.

W. J. Carden.—Two mines are being operated upon Mr. Carden's land—one a shaft and the other a slope; the shaft was on date of inspection being operated by Davis & Lawrence; slope operated by Pieson Bro.; mines are located about one mile south of Quitman.

E. Dixon.—Mine located southwest of Burlington Junction. Coal from 8 to 10 inches thick; worked on the long-wall plan. On date of inspection it was being operated by H. Howard; coal used for home consumption.

Reuben Harris.—Mine located about $\frac{1}{2}$ mile east of Quitman; shaft 50 feet deep; horse power; coal about 14 inches thick, and worked long-wall.

Kessinger Mine.—Located about $\frac{1}{2}$ mile south of Quitman; shaft 35 feet deep; horse power; mine operated in fall and winter for local consumption.

Nicholas, Joseph.—Mine located about $2\frac{1}{2}$ miles southeast of Quitman; shaft 32 feet deep; horse power; coal about 1 foot in thickness; from 2 to 6 men employed.

Norton, Roberts.—Shaft 40 feet deep; horse power; mine located near Quitman, and is worked in fall and winter for home consumption; 8 to 10 men are employed when mine is in operation.

There are also a number of other small mines in the vicinity of Quitman, which are worked in fall and winter to supply local demand.

PUTNAM COUNTY.

The report of 1890 gives the output of coal in this county at 91,584 tons, which was valued at \$116,883; while this report shows an output of 123,526 tons, valued at \$143,554 at the mines—showing an increase of nearly 35 per cent in the product of coal. This increase is probably due to the recent strike among the miners in Iowa.

Blackbird Coal company—C. W. Long, president, and Wm. Love, mine superintendent; mine located about $2\frac{1}{2}$ miles north of Unionville; connected with the C. B. & K. O. R. R. by a switch; mine was formerly owned and operated by Castello and Sunderland, but in September, 1890, was purchased by the present company. At date of inspection

(April 17) the mine was found to be poorly ventilated. However, a part of the hoisting shaft was being bratticed off for an air-shaft, in which a small furnace was to be erected. Prior to this inspection natural ventilation had been depended upon; from 3 to 8 miners are employed.

In a letter addressed to me under date of August 10, Mr. Love states that since my last inspection, a hoisting engine has been erected to take the place of the old horse hoister. The coal is about 30 to 32 inches in thickness; worked on the pillar and room plan; from 3 to 10 miners are employed.

Corder, D. M. S.—Was opening a mine on Wm. Adkins' land, located about 3 miles north of Unionville; shaft 30 feet deep; horse power; coal from 30 to 32 inches thick and worked pillar and room plan.

Mendota Coal and Mining company.—Mr. W. Ketcham, president, and Mr. B. H. Johnston, superintendent; mines are located at Mendota; connected with the C. B. & K. C. R. R. by switches. Company owns about 1,800 acres of coal land in this county, bordering on the Iowa line; it varies in thickness from 30 to 36 inches, and is well adapted to either the pillar and room or long-wall plan, both of which are being used, but the pillar and room plan is preferred.

Two mines are in operation, both of which are equipped with revolving screens for separating the coal into different grades. Coal consumed in Kansas, Missouri, Iowa and Nebraska.

Mine No. 1.—Is a drift and ventilated by two furnaces. A measurement of the air, on north side, and within twenty-five feet of the furnace, showed 9,590 cubic feet passing per minute. The ventilation has been much improved in this part of the mine. While the measurements do not show an increase in the amount of air passing, yet it is confined more to the working face than it was on the inspection of one year ago, two cross roads having been made from one cross entry to another, through which the air is conducted. These cross roads lessen the distance the air has to travel some 1600 feet, and, of course, better its condition.

The ventilating furnace on the south side was not giving proper results, not more than 5,900 cubic feet of air passing. However, the fire in the furnace was low when the measurement was taken, and the cause of this deficiency of air was probably due to the great distance the air had to travel. An air course, or, as they term it, "a header," is being driven from the ninth to the tenth north entry, and when this is complete, nearly 1800 feet of air-course will be cut off. Mr. Johnston's attention was called to the want of sufficient air in this part of the mine, and he assured me that the matter would be attended to immedi-

ately, and in due time he notified me that the air-courses had been gone over and the air shut off from an old abandoned entry known as the "muddy south," thus lessening the distance it had to travel several hundred feet, and according to Mr. Johnston's statement, made a great improvement in the ventilation.

Roadways and drainage good. The coal is brought to the surface by machinery, a wire rope being used. The main rope is about three-fourths of an inch in diameter and nearly one mile in length. From 15 to 25 cars are brought from the mine at a trip. E. C. Smith is mining boss.

Mine No. 4—Slope; steam power; and was, on date of inspection (April 16), being ventilated by a furnace located near the mouth of the slope, but it was giving poor satisfaction on account of small air-courses through which the air had to pass; in fact, not more than 5,200 cubic feet was passing per minute. After making a thorough examination of all parts of the mine, and finding several parts which were poorly ventilated, I notified the superintendent of the fact, and suggested that his company sink an air-shaft near the main part of the work, and from a point as near the top of the hill as possible, and in a letter addressed to me, under date of May 4, Mr. Johnston says: "We have looked over the No. 4 ground, and Mr. Ketcham has concluded that we will sink a new shaft at the head of the works, on the main east air-course. The inside has been surveyed and levels taken on the outside; the shaft will be 100 feet deep, and the highest point in that vicinity is only 132 feet above coal, so you see we will be up on top." I have since been notified by Mr. Johnston that the shaft has been completed.

Mining is also carried on in this county by a number of small operators at different places, but time would not permit me a personal visit to each. Having obtained the names of the operators, request was made for a report of their operations, which has been complied with in most cases. The principal local operators in the county are as follows: Martin Pherigo, Oliver Chadwick, G. E. DeGarmo and Pat Gorman.

RANDOLPH COUNTY.

Coal seems to underlie nearly all of this county, and is being worked at Huntsville, Renick, Elliott, Higbee, Thomas, Hill and near Moberly. The C. & A., Wabash and M., K. & T. B. R.'s pass directly through the county, furnishing transportation for the product.

The coal product has shown a decrease during the past year as compared with the preceding year. This is attributed to the closing

down of the Huntsville Coal & M. Co.'s mine, and the Osage Coal & M. Co.'s mine. These two mines gave employment to about 100 men each.

ELLIOTT POSTOFFICE.

Osage Coal and Mining Co.—Plant located at Elliott and connected with the M., K. & T. R. R. by a switch. Mine is well equipped with good machinery, and has a capacity of about 250 to 300 tons per day. The company reduced the price of mining July 1, 1890, from 94 to 80 cents per ton. Miners went on strike, and mine was idle until November, at which time it was leased to Thos. Fleming, who started the men to work at the reduced price. In February the mine was again closed down, and is still idle.

HIGBEE POSTOFFICE.

Higbee Coal & Mining Co.—Wm. Walton, Supt. Mine located at Higbee; connected with the C. & A. R. R., by a switch. An inspection was made February 19, and I found the ventilation much improved since last inspection; a measurement which was taken near the foot of the hoisting shaft showed 11,430 cubic feet of air passing per minute, and it was being forced and circulated o all parts of the mine reasonably well. Of course, falls of slate occur occasionally along the working face, which partially blocks the ventilating current in that part of the mine until it can be removed; but this is no uncommon thing in mines worked on the long-wall system. Coal varies in thickness, from 3 feet, 8 inch to 4 feet.

Mine well drained; roadways in good condition; pay for mining, 80 cents per ton. Coal consumed by C., A. & R. R. Co., and at points along this road.

Interstate Mining company.—Col. John S. Elliott, president, and Wm. Walton, superintendent; mine located about one mile south of Higbee; connected with the M. K. & T. R. R. by a switch. I visited and made a careful examination of this plant February 18, and found the machinery, cages, safety-catches and gates around shaft-top in good condition. At this date, ventilation was produced by a 12-foot fan, situated at the top of the hoisting-shaft, a part of which was bratticed off by wooden brattice-work, and used for a return of the air-current. This, however, was only done temporarily, as the company was sinking an air and escapement shaft, which has since been completed and the ventilating fan removed and placed over the air-shaft, which is, according to a letter from Mr. Walton, giving good results.

The average thickness of coal is about 3 feet 6 inches, and is worked on the long-wall plan. This method seems to be giving entire satisfac-

tion. The only complaint I had to make at date of inspection was in regard to an escapement shaft; we can hardly call this a complaint, because the escapement shaft was being sunk at that time, and was down about 30 feet below the surface, and has since been completed.

The plant is comparatively a new one, having been in actual operation only two years, yet it employs about 180 men and boys, and has a capacity of from 400 to 500 tons of lump coal per day. Coal consumed by Missouri, Kansas & Texas R. R. Co.

HUNTSVILLE POSTOFFICE.

Randolph County Coal company.—John Breckenridge, president; owns three mines situated near the town of Huntsville, all of which are connected with the Wabash R. R. by switches. The coal varies from 3½ to 4 feet in thickness, and is worked on pillar and room plan. Following is a partial description of each mine, with a statement as to the condition in which they were found at date of inspection :

Mine No. 1½.—Steam plant; shaft 98 feet deep equipped with a pair of small hoisting engines, geared to a 5-foot drum; two steam boilers and a 10 foot ventilating fan. The fan is situated at the top of main hoisting-shaft, a part of which is bratticed off and used as an air-shaft. Inspections were made February 16, April 7 and 11.

On first inspection the fan was making only about 50 revolutions, and removing about 8,800 cubic feet of air per minute. This air, of course, could be increased at any time by increasing the speed of the fan, but the air was not being properly conducted around the mine, for the want of doors or brattice cloth. There was no protection around the shaft top, nor roadway from one side of the shaft bottom to the other, except passing either under or over the cages. Mr. Breckenridge was notified of the defects and requested to have them remedied. At second inspection gates had been placed around shaft top, but no roadway had been made around shaft bottom. I again called the manager's attention to the necessity of a roadway around the shaft bottom and urged that it be made. This was on the 7th day of April, and on the 9th Mr. Wm. Williams lost his life by attempting to cross the cage. (See report of accident elsewhere.) Roadways good, and mine well drained.

Mine 3½.—Is also a steam plant, located near the Wabash railroad depot; inspections were made February 14, and April 6 and 7.

It is ventilated by a 10-foot fan, which sets at the top of the hoisting shaft, a part of which is bratticed off and used for an air return; the fan is constructed in such a manner that it receives air only from one side, and is run by a small engine, which also runs the elevator

and revolving screen. The elevator sometimes gets choked up and causes the stopping of the fan engine. This was the case several times the day first inspection was made. Three measurements of air were taken—first, on the first west entry, within 85 feet of the shaft bottom, and showed less than 2,000 cubic feet per minute, but not all the air was expected to pass up this entry; second measurement was taken on second east entry, about 300 feet from shaft bottom, showing 3,410 cubic feet per minute; third was taken on the return air-course, where all the air was confined in one body. This measurement showed 6,750 cubic feet per minute. I examined all parts of the mine, and found many unfit places where miners were still at work. An old man by the name of Thos. Griffith was working in a place so poorly ventilated that he could only work half time.

The return air-course from head of third west entry was partly closed by a fall. The aperture was so small we could not get through it, and 8 men were found to be working inside of the last break-through on fourth west entry.

The only entry in the entire mine that was being even fairly well ventilated was the first east, and it was being ventilated by a current of air from the old escapement road.

The escapement road was found in bad condition: in fact it could not be called an escapement, as the road was partly filled with mud and water, and in places not more than two feet high.

After making this inspection I immediately, through the prosecuting attorney, commenced criminal prosecution against Mr. Breckenridge. (See litigation elsewhere.)

Second inspection: Mine not in operation: that is, no coal was being hoisted, having closed down at noon, but the miners were at work getting coal ready for the next day's run. The fan was making about 100 to 105 revolutions when I went down the shaft, but was making about 120 when I came out. Measurements of air were taken on first west entry and at the same place it was taken at first inspection, and showed 6,150 cubic feet passing per minute, and on return air-way and within 12 feet of the shaft bottom or upcast this measurement showed about 9,830 cubic feet passing per minute. It was found that the air-courses had been much improved since the inspection which was made in February, and the mine reasonably well ventilated. But the escapement roadway was in no better condition. This came near causing another case in court, but was finally adjusted by Mr. Breckenridge agreeing to sink an escapement shaft in a more convenient place, which he has done—sinking an escapement shaft within 125 feet of the hoisting shaft.

Mine No. 2½—Closed down about the first of February, the men being employed at the other mines.

Elmore, T. M. & company—B. McHugh, mining superintendent. This was formerly known as the Woodard Coal & M. Co.'s Mine No. 3; located at Huntsville and connected with the Wabash railroad by a switch.

The company has purchased 23 acres of coal land adjoining the shaft on the northeast, and were driving entries at date of inspection (April 7), preparatory to commencing operations. The mine is ventilated by a 12-foot fan; shaft 75 feet deep; coal worked on the pillar and room plan.

Eureka Coal & M. company—W. Rutherford, jr., superintendent. Mine located about $\frac{1}{4}$ mile west of Huntsville, and is locally known as "New Eureka," the old mine having been worked out and abandoned during the past year.

Inspection was made February 14, and was found to be well drained and in good condition; coal from $3\frac{1}{2}$ to 4 feet thick; worked pillar and room.

Huntsville Coal & M. company—Mine No. 1, steam plant, located about 3 miles east of Huntsville; connected with Wabash railroad by a switch.

Mine closed down the 1st of February, and, as I understand, has been idle ever since. This plant when in operation gives employment to from 60 to 100 men and boys.

James, George—Mine located at Huntsville; drift; employs from 4 to 7 miners.

Lows, John—Drift; located at Huntsville; coal from $3\frac{1}{2}$ to 4 feet thick; worked pillar and room plan.

MOBERLY POSTOFFICE.

Moberly Mutual Coal company—Located about 2 miles west of Moberly; operated by Perkins Bros.; shaft 105 feet deep; horse power; coal worked for home consumption.

Harry Ward—Mine located 2 or 3 miles west of Moberly; shaft 88 feet deep; horse power.

Williams, J. B.—Shaft 96 feet deep; horse power; coal from $3\frac{1}{2}$ to 4 feet in thickness, and worked on the pillar and room plan. Mine operated for home consumption.

RENICK POSTOFFICE.

Enterprise Mining company—E. L. Hubbard, superintendent; mine located at Renick; connected with the Wabash railroad by a switch. It is a co-operative company composed of miners and business men of Renick. Shaft was sunk last fall, and the first coal hoisted in December. The shaft is about 100 feet deep and well timbered from top to bottom. Machinery is well constructed, and consists of a pair of engines 10x16-inch cylinders connected to a 5-foot drum; cages, safety catches and bonnets in good condition.

A part of the hoisting shaft is bratticed off and used as a ventilating chamber.

The entries had only been driven a short distance from the bottom at date of inspection (February 16), but they were being driven in a systematic manner.

RAY COUNTY.

This county ranks as the fourth coal-producing county of the State. Her output during the year ending June 30, 1891, was 282,247 tons, valued at \$446,860. The report of 1890 shows an output of 240,462 tons, valued at \$387,346 at the mines—an increase for past year of 41,785 tons.

The average price per ton at the mines has advanced from \$1.61 per ton in 1890 to \$1.86 in 1891.

Following is a description of the mines, with a statement showing the condition of each one at date of inspection:

CAMDEN POSTOFFICE.

Bovard-Brown Coal company—J. D. King, superintendent; mine located about 2 miles east of Camden, and connected with the Santa Fe railroad by a switch. I visited and made an inspection of this mine December 12, and found the ventilating furnace inadequate to furnish the amount of air required; I therefore notified the superintendent of the deficiency and requested him to increase the size of the furnace at his earliest convenience, and he notified me a few days later that my request had been complied with. An escapement shaft has been sunk during the past year.

Craven's Coal company.—Mine located about one mile east of Camden and connected with the Wabash R. R. by a switch. This is a new shaft, sunk in November, 1890; the shaft being 28 feet deep, well timbered and in good condition. The machinery was being put in place at date of inspection (December 12). Coal is about 20 inches thick and will be worked on the long-wall plan.

FLEMING POSTOFFICE.

Kansas & Texas Coal company, Mine No. 30.—John B. Braidwood, superintendent, and George W. Keirstead, assistant superintendent.

Mine located at Fleming and connected with the Wabash R. R. by a switch.

I visited and made a careful examination of the mine December 11, and found that the new fan which was erected last year has made a great improvement in the ventilation. The fan was making about 55 revolutions per minute and removing about 9,350 cubic feet of air in the same time. This, of course, can be increased at any time by increasing the speed of the fan. Machinery for hoisting, etc., is in fair condition, but no safety catches nor bonnets were on cages. Mr. Keirstead was notified to have these matters attended to as soon as possible.

Mine well drained and in good condition. The company has erected 10 new dwelling-houses for the employes during the past year.

HARDIN POSTOFFICE.

Bryant, J.—Mine operated by John McCorkendale; located about 5 miles north of Hardin; drift; worked in fall and winter for home consumption.

Campbell, Mrs. M.—Mine operated by Wm. Phillips; drift; located about $3\frac{1}{2}$ miles north of Hardin. The coal is about 18 inches thick and worked long wall.

Huston, John.—Mine operated by Joseph Huston; drift; located about $4\frac{1}{2}$ miles north of Hardin; worked in fall and winter for home consumption.

Kellenberger Mine.—Operated by W. J. McCorkle; drift; operated for local consumption only; 4 to 5 miners employed in fall and winter.

Fred Buchlinger is also operating a small mine upon this land.

Hartwell, Arnold & Co.—J. W. Turner, Norborne, Carroll county agent; mine located 4 or 5 miles north of Hardin. Coal is about 18 inches thick and worked on the long-wall plan; from 7 to 15 men are employed.

Dickson, H. A. & Son.—Mine located about $3\frac{1}{2}$ miles north of Hardin; shaft 83 feet deep; horse power; mine is worked for home consumption.

Osborn, Robert.—Drift; located about 3 miles north of Hardin; the coal is from 16 to 20 inches in thickness and worked on the long-wall plan.

Sickles, Wm.—Mine located about $4\frac{1}{2}$ miles north of Hardin; worked in fall and winter for local trade.

RICHMOND POSTOFFICE.

Black Diamond.—Mine operated by W. H. Pence; mine was inspected December 12, and found to be fairly ventilated, but drainage poor; shaft 75 feet deep; horse power; from 4 to 10 miners are employed.

Darneal Coal company.—W. H. Darneal, superintendent, and John Grierson, mine boss. The mine is located about one mile west of Richmond and connected with the St. Joe & Santa Fe R. R. by a switch.

We made a careful inspection of this mine December 10, and found it well ventilated by a small furnace, which is located near the bottom of hoisting shaft, one part of which is bratticed off and used as an air-shaft. This small furnace was giving good results; but it will soon be necessary to increase its size, for the reason that as the working face advances, it will necessarily increase the length of air-courses, hence increasing the friction.

In October, connection was made with Joseph Pickering Coal Co's. mine, which furnishes a good escapement for the employes.

After making an examination of the mine and hoisting apparatus, and taking into consideration the rough usage the cages and safety catches are subjected to, together with the safety of the employes, who are compelled to pass up and down in the same, I concluded they were too light, and so notified Mr. Darneal, who assured me the matter would be promptly attended to, which it has; new cages having put in.

Douglas & Moore.—Mine located 1 mile east of Richmond; shaft 59 feet deep; horse power. This mine was formerly operated by Mosby & Allison.

Hubbell Coal company.—John Hubbell, superintendent, and John W. McCart, mining boss. Mine located at Richmond and connected with the St. Joe & Santa Fe R. R. by a switch.

This is a steam plant, reasonably well constructed; ventilation is produced by a furnace, which was, on date of inspection (December 10), giving good results. However, the air-current was dull, on and to the right of first north entry. On the south side of shaft this same want of air was caused by the brattice-cloth leaking on north entry. The attention of the mine superintendent was called to this matter, and he was instructed to have the brattice-cloth fixed at once. With this exception, I found the mine in reasonably good condition.

Hubbell, Hyatt & Hubbell Coal company.—John Hubbell, superintendent, and John McCart, mine boss. Mine located at Richmond and connected with St. Joe & Santa Fe R. R. by a switch.

This plant is known as No. 7; shaft 114 feet deep; steam power; machinery, cages, safety catches and other appliances were found to be in fair condition. Ventilation is produced by a furnace, located near the bottom of hoisting shaft, a part of which is bratticed off and used as an air-shaft, but it was not giving results required by law; while the furnace is reasonably well constructed, yet it is, in our opinion, impossible for it to produce the amount of air required, owing to the long and small air-course through which it has to pass; of course, in cold weather the furnace does reasonably well, but in summer it is a matter of impossibility for it to furnish the necessary amount of air. I consulted Mr. Hubbell in regard to the matter, and recommended that a fan be erected to take the place of the furnace, and he said that he would give the matter his immediate attention. Mine is well drained, and with the above exception, in good condition.

Hughes, Berry—Mine located about $1\frac{1}{2}$ mile east of Richmond; operated by George O. Cooper; is a shaft 30 feet deep; horse power; coal used for home consumption.

Joseph Pickering Coal company—Mine located about 1 mile west of Richmond, and connected with the St. Joe & Santa Fe railroad by a switch.

This is a new plant, having been put in operation about one year ago; and it is reasonably well constructed for economy and convenience. The working face had just been completed around the shaft bottom at date of inspection (December 10), not enough coal having been excavated to bring on the weight necessary to break down the coal after it had been undermined.

An escapement road completed to Darneal Coal Co.'s mine furnishes a good and easy ingress and egress for the employes, in case of an accident to hoisting shaft.

Coal is consumed in Missouri, Kansas and Nebraska.

W. D. Rankin & company—Mine located about one mile northwest of Lexington Junction and connected with the St. Joe & Santa Fe railroad by a switch.

The coal is worked through a drift, and is about 22 to 24 inches thick and worked on the long-wall plan. Mine is ventilated by a small furnace, which was, on the date of inspection, giving fair results; drainage good.

Richmond Coal company—John Gibson, superintendent. This company owns and operates a number of mines near Richmond and Camden. Those located near Richmond are connected with St. Joe & Santa Fe railroad by switches, and those located at Camden are connected with both the Santa Fe and Wabash railroads.

The coal varies in thickness from 21 to 24 inches, and is overlaid with a good roof which requires but little timbering. In fact, some of the miners rarely set a timber, but build pillars of the draw slate to support the roof. These mines furnish employment to from 340 to 485 men and boys.

Following is a partial description of each mine, with a statement as to the condition in which each was found at dates of inspection:

Mines Nos. 1 and 2—Are located about 1 mile west of Camden; both are good and substantial plants, equipped with good machinery. Mine No. 1 is situated about 400 feet west of No. 2; underground traveling roads connect the two shafts; hence one is an escapement for the other. Both of these mines are ventilated by furnaces, both of which are located near the bottom of hoisting shafts. Each of the hoisting shafts is divided by partitions into cage-ways. The upcast or ventilating shafts are bratticed off from the main hoisting shafts by wooden brattice work, with chimneys extending above the tip-houses. The board or brattice work which separates the upcast and downcast shaft at No. 2 was leaking a great deal of the air at date of inspection (December 11). The attention of the mining boss was called to this leakage, and he went to work immediately to stop the same. It was also found that the ventilation was so arranged that two-thirds of all the employes in both mines were being ventilated by this furnace, and as the furnace is too small to furnish the amount of air required, I notified Mr. S. Gibson, assistant superintendent, that it was necessary for the air in these mines to be divided in such a manner that each furnace shall have an equal amount of work to perform, as neither of them was large enough to properly ventilate more than the workmen now employed in its respective part of the mine; and he assured me that he would give the matter his immediate attention. Both mines fairly well drained.

Mine No. 3—Is a steam plant, located about two miles south of Richmond, and is connected by underground passages with Nos. 4 and 5; hence one is an escape for the other.

I visited and made a careful inspection of this mine December the —, and found the ventilation current inadequate. This was caused by the small furnace and the long air-courses through which the air had to pass, although the principal trouble was with the furnace. Even the small amount of air that was being forced into the mine was not being properly conducted around the working face. There were twelve or fourteen miners working on the northeast entry, who were ahead of the ventilation current, this being caused by the carelessness of the mining boss, who had neglected to replace on entry a brattice cloth which had been torn down.

Mine No. 4—Steam plant, located about five or six hundred feet north of No. 3. It was being ventilated by a small furnace at the time of first inspection, but not giving good results. The furnace being too small made this defect. Roadways were wet and muddy in many places, caused by water leaking from the roof. Machinery for hoisting and other appliances in good condition.

Mine No. 5—Is a steam plant equipped with good machinery; ventilation is produced by small furnace, which like Nos. 3 and 4 was giving poor results; on first inspection, Mr. Gibson the superintendent, was notified of the deficiency of air in these three mines, and duly informed that the mining law would be enforced unless ventilation was increased. After considering the matter, he notified me that he had concluded to erect a fan at No. 5, to ventilate the three mines, which he did, putting in a 12-foot fan. I again visited these mines July 1, to satisfy myself if the fan had been erected and was giving good results, and found the mines well ventilated and in reasonably good condition—much better, in fact, than on any previous inspection.

The timbers in this shaft gave way August 15, 1890, and the hoisting shaft closed in. This occurred while the miners were at work, but fortunately they had free access to the escapement shaft, therefore all passed out in safety. The shaft was retimbered as soon as possible.

Mine No. 9.—This is the only mine operated by the company where hoisting is done by horse power. It is a shaft 100 feet deep and ventilated by a furnace which was on date of inspection, December 9, giving good results. Mine dry and in good condition.

SWANWICK POSTOFFICE.

R. J. Williams Coal company.—Mine located at Swanwick and connected with the St. Joe & Santa Fe R. R. by a switch.

Coal is brought to the surface through a vertical shaft 95 feet deep, and is about 18 inches in thickness and worked on the long-wall plan. Mine was inspected December 10, and found to be in fairly good condition. I was informed that some of the employees had been making a practice of going up and down on the cages while coal was being hoisted, and as such a practice is in violation of law, I notified the superintendent not to allow any one on the cages while coal or timbers were being lowered or hoisted; this order, he assured me, would be strictly enforced in future.

SALINE COUNTY.

Coal is being worked at Sweet Springs, Cretcher, Mt. Leonard, Slater, Napton and near Arrow Rock, but not to any great extent; it is used for home consumption. The coal mined at Napton and near Arrow Rock is found in deposits, and is said to be from 20 to 40 feet in thickness in the center of the deposits; but at the other places named, it lies in seams and not more than 18 to 24 inches in thickness. The mines visited by me are as follows:

Beard, Wm.—Mine located about 2½ miles southeast of Slater. It was formerly operated by J. T. Copland. The coal is about 18 inches thick, and worked on the pillar and room plan.

Hunter, Wm.—Mine located about 4 miles southeast of Slater. It is operated by John Tennill; coal is about 18 inches thick, and worked on the long-wall plan; coal used for home consumption.

A number of other parties are operating small mines in the vicinity of Slater, but time would not permit a personal inspection of each, but the names of the parties operating mines were furnished me, and are as follows: R. P. Thompson, Marten Auer, Barney Hunter, Isaac Biggs and Wm. Hedger.

H. H. Marmaduke—Mine located 1½ mile southwest of Sweet Springs; shaft 60 feet deep; horse power; the coal is from 18 to 20 inches thick, overlaid with 6 to 8 inches of slate, which comes down with the coal; ventilation is produced by a small furnace, which was giving good results at date of inspection (May 4); mine well drained and in good condition.

Wilburn Coal company—H. J. Stewart, manager; mine located 2 miles north of Napton; shaft 80 feet deep; steam power, engine having been put in during the past year. The coal is in a deposit and is said to be twenty feet thick; it is a soft bituminous coal, and used for home consumption.

SULLIVAN COUNTY.

Milan Land and Coal Mining company.—Webster Clark president. Mine located at Milan. This company organized and commenced to sink for coal April 1890, and in November the coal was struck at a depth of 190 feet. It is from 3 to 3½ feet in thickness, overlaid with a shale roof.

Mine was inspected April 18, 1891; at that date the entries were being driven preparatory to turning rooms. The tip-house is reason-

ably well arranged for convenience, etc. Hoisting is done by a pair of 190-horse power engines, connected direct to a six foot-drum; steam is generated by two large boilers. One part of the hoisting shaft is bratticed off, and used as a ventilating shaft, with ventilating chimney, extending up above the head-house.

No railroad connections had been made with the mine at date of inspection, although it is conveniently located to both the Q., O. & K. C. and C. B. & K. C. railroads.

I am informed that about \$13,000 has been expended in the erection of the plant.

ST. CLAIR COUNTY.

Mining is being done at Vista, Lowry City, Taberville and near Osceola, but only in a limited manner. Coal is principally used to supply home consumption. The only mine having railroad connection is located at Vista, and operated by Owen Coal Co. This company, however, ship most of their product to Springfield and other towns along the line of K. C., Ft. S. & M. R. R.

An inspection of all of the mines in the county was not made, but schedules returned from the mine operators show the coal to vary in thickness from 18 to 3½ feet—the thickest being reported from Vista, and the thinnest from Lowry City.

VISTA POSTOFFICE.

Owen Coal Co.—Jay Owen, manager. Mine located at Vista, and connected with the K. C., Ft. S. & M. R. R. Slope; ventilated by a small furnace, which was on date of inspection (November 29) giving poor results, caused by the ventilation not being properly conducted around the working face. The attention of Mr. Betz, mine boss, was called to this defect, and he was instructed to give the matter his immediate attention. Mine is wet and muddy. Coal from 2 to 3 feet in thickness and worked pillar and room plan. Pay for mining screened coal 75 cents per ton in summer, and 80 in winter.

VERNON COUNTY.

Coal is being mined at Bellamy, Bronaugh, Sheldon, Walker, Milo, Moundville, Nevada, Kitterman and Carbon Centre. In fact, coal has been mined in nearly every township in the county. The seams now being worked vary in thickness from 18 inches to 5 feet. At Carbon Centre, I am told, it has been found even 6 and 7 feet in thickness. It is being worked from the surface to a depth of 130 feet, and where it is found near the surface the overlying clay is removed and the coal quarried out. This method of working is called "stripping." There is probably more of this kind of mining (stripping) being done in this county than any other county in the State. Railroad facilities are good. The Missouri Pacific railroad passing through the county from north to south; the M., K. & T. railroad from northeast to southwest, and a branch of the K. C., Ft. S. & M. railroad extends to Carbon Centre, the greatest coal shipping point in the county.

The output during the past year shows an increase of more than 93 per cent over the preceding year.

CARBON CENTRE POSTOFFICE.

Allen, R. E.—Mine located about 1 mile south of Carbon Centre; connected with the K. C., Ft. S. & M. railroad by a switch. This has been a valuable plant, but the mine is now nearly exhausted, most of the work being confined to drawing pillars.

Bryan, Wm. O. & Co.—Strip-pits; located at Carbon Centre; coal consumed in Missouri and Kansas.

Hoss, G. S.—Is operating a number of strip-pits at Carbon Centre, also one slope which was, at date of inspection, being run by Messrs. Orris & Shilling. The coal is about 4 feet thick and worked on the pillar and room plan. Mine is in reasonably good condition. Inspection was made November 11, 1890.

Hurst, E. N.—Slope; located at Carbon Centre; mine was idle at date of inspection (November 11), and had been for several months, but preparations were being made to commence operation again.

KETTERMAN POSTOFFICE.

Timber Hill Coal mine—Operated by A. O. Finley; shaft 63 feet deep; horse power; mine inspected November 11; at that date the company had just completed a new shaft, and were driving entries preparatory to turning rooms. This shaft is located only a short distance from the old one. It is the intention to drive a roadway from one shaft to the other, to be used as an escapement and ventilating shaft.

MOUNDVILLE POSTOFFICE.

Devore, J. M.—Mine located at Moundville; shaft 35 feet deep; horse power; coal 24 to 30 inches thick; worked pillar and room plan.

Hill, W. L.—Mine located 1 mile north of Moundville; shaft 26 feet deep; horse power; ventilated by a small furnace, which was not giving good results at date of inspection (November 18). This was caused by the ventilating furnace not being properly looked after. The air which was being removed by the furnace was not properly conducted around the works. Mr. Hill's mine foreman was notified of this deficiency in the ventilation, and requested to have it adjusted immediately. Mine well drained and otherwise in fairly good condition.

Robinson, W. D.—Shaft 30 feet deep; located at Moundville. The mine was being operated by Mr. Shields at date of inspection; but I understand it has since changed hands. The coal is about 30 inches thick; worked pillar and room plan.

Warner Powell—Mine located about $\frac{1}{2}$ mile west of Moundville. The mine is new, having been sunk during the past year; the coal is about 30 inches thick; worked pillar and room plan; mine operated for home consumption.

Keith & Perry Coal company—John Perry, general manager; Geo. R. Sweeney, superintendent.

The mine is located about 3 miles south of Rich Hill and about $\frac{1}{2}$ mile south of the Bates county line; the shaft was sunk October, 1890, and the machinery removed from No. 6 and erected during the following spring; many of the miners' houses were also removed from No. 6 and placed near this mine. The plant is well equipped for the economical and convenient handling of coal. Owing to some trouble in securing the right of way for a railroad switch, the mine has shipped no coal during the past year. However, this trouble has been adjusted and a connection made with the Mo. P. R. R.

The coal is about 4 feet in thickness, overlaid with a black slate roof.

Table IV—Showing by Counties the Character, Tonnage and Value of Output of Coal Mines in Missouri for the year ending June 30, 1891.

County.	No of mines	Kind of power.	Kind of opening.				Kind of ventilation.	No. kegs of powder used.	Cost of powder....	No. of mules.		Employees.				Total No. of tons mined	Average value per ton at mine	Value of output at mine	Casualties.				
			Shaft	Slope	Drift	Strip				Miners.	Others.	Total.	Fatal.	Non-fatal.									
Adair.....	7	1	2	1	4	1	1	500	\$1,250 00	4	3	68	31	9	6	4	77	37	17,110	\$1 64	\$28,511 25	1	1
Andrain.....	11	2	7	10	18	1	6	14	35 25	14	12	95	60	15	4	1	110	64	19,569	1 63	30,088 07	1	1
Barton.....	89	2	2	8	11	10	2	2,331	5,219 25	14	57	269	128	57	30	1	396	153	68,636	1 45	92,178 84	7	10
Bates.....	42	9	10	5	4	22	8	7,835 04	74,849 90	60	12	784	632	305	182	1	1,069	353	786,273	1 45	792,740 88	7	10
Boone.....	20	6	2	7	3	4	6	190	436 55	5	5	114	48	18	9	1	132	57	38,577	1 46	34,574 80	2	5
Caldwell.....	12	6	6	6	1	3	1	2	4 50	2	2	95	35	8	2	1	113	94	32,661	1 80	40,877 08	2	5
Callaway.....	4	1	1	1	1	1	1	2	6 25	2	2	75	53	8	2	1	83	35	15,581	1 60	24,377 08	1	1
Cedar.....	4	1	1	1	1	1	1	2	6 25	2	2	8	35	6	2	1	15	41	1,984	2 00	1,666 00	1	1
Charlton.....	3	1	1	1	1	1	1	75	150 00	6	50	35	7	6	7	6	57	41	8,289	1 80	14,920 20	1	1
Clay.....	1	1	1	1	1	1	1	12	27 50	6	11	6	3	7	7	7	13	10	2,000	1 50	3,000 00	1	1
Cole.....	2	1	1	1	2	4	1	13	27 50	6	11	6	3	7	7	7	13	10	2,000	1 50	3,000 00	1	1
Dade.....	6	1	1	1	2	4	1	12	27 50	6	11	6	3	7	7	7	13	10	2,000	1 50	3,000 00	1	1
Grundy.....	1	1	1	1	1	1	1	8,897	7,104 65	6	4	90	70	15	14	1	105	84	28,968	1 69	5,718 50	3	4
Henry.....	17	7	6	11	3	1	2	7	7,104 65	15	12	898	277	103	80	501	367	638	144,189	1 47	211,884 01	1	3
Jasper.....	1	1	1	1	1	1	1	83	68 80	1	65	26	4	3	68	29	1	5	638	1 50	949 50	1	3
Johnson.....	15	6	18	22	7	23	1	118	282 00	23	7	1313	720	199	147	1512	867	10,530	1 62	17,100 50	1	3	
Lafayette.....	48	6	18	22	7	23	1	118	282 00	23	7	1313	720	199	147	1512	867	10,530	1 62	17,100 50	1	3	
Linn.....	4	1	1	1	1	1	1	800	1,480 00	2	2	90	77	20	14	110	91	28,086	1 59	44,330 09	1	3	
Livingson.....	1	1	1	1	1	1	1	8	10 72	105	96	921	823	308	291	1293	1114	454,029	2 25	576,678 51	3	4	
Macon.....	14	11	11	10	1	1	1	10,772	19,980 00	105	96	921	823	308	291	1293	1114	454,029	2 25	576,678 51	3	4	
Miller.....	1	1	1	1	1	1	1	6	13 50	1	2	1	1	1	1	1	1	1	190	2 50	925 00	8	4
Monroe.....	1	1	1	1	1	1	1	6	13 50	1	2	1	1	1	1	1	1	1	476	2 00	984 00	1	1
Monteau.....	1	1	1	1	1	1	1	6	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Montgomery.....	2	1	1	2	6	4	1	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Monroe.....	2	1	1	2	6	4	1	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Morgan.....	11	5	5	5	6	4	5	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Nodaway.....	17	2	2	2	2	2	2	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Putnam.....	11	5	5	5	6	4	5	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Ralls.....	3	5	5	5	6	4	5	1	13 50	1	2	1	1	1	1	1	1	1	12	2 00	24 00	1	1
Randolph.....	19	6	8	10	4	5	8	1	4,492 15	22	19	492	406	77	67	569	473	985	2,222	3 48	5,504 50	2	2
Ray.....	28	11	7	18	10	15	2	1,971	4,492 15	22	19	492	406	77	67	569	473	985	2,222	3 48	5,504 50	2	2
Saline.....	13	1	2	3	4	6	3	100	235 00	24	21	968	533	180	116	1183	649	324,765	1 84	1,161 00	1	1	
Schuyler.....	2	3	3	1	1	1	1	1	235 00	9	9	64	16	14	6	68	26	7,981	1 84	14,640 00	2	2	
Shelby.....	2	3	3	1	1	1	1	1	235 00	9	9	64	16	14	6	68	26	7,981	1 84	14,640 00	2	2	
Sullivan.....	1	1	1	1	1	1	1	1	235 00	9	9	64	16	14	6	68	26	7,981	1 84	14,640 00	2	2	
St. Clair.....	1	1	1	1	1	1	1	1	235 00	9	9	64	16	14	6	68	26	7,981	1 84	14,640 00	2	2	
Vernon.....	83	7	1	6	5	5	28	1,990	8,777 50	2	1	62	14	11	2	68	18	3,865	2 00	1,120 00	3	3	
Totals.....	385	64	98	140	87	97	81	42	55,366	289	269	4541	4438	1663	1221	8104	5664	2,650,018	1 3135	8,480,898 88	18	83	

Character, Tonnage and Value of Output of Coal Mines in Missouri for Year Ending June 30, 1891.

ADAIR COUNTY.

Name of firm, person or company.	Kind of power.	Kind of opening.				Depth of shaft...	Kind of ventil'n		Diameter of fan.	Mode of work'g.	Av. thickness of vein in ft. and in.		No. of kegs powder used during the year.	Cost of powder for the year.....	No. of mules		No. of miners.	Other empl.		Total empl.		Av price per ton for mining.		Total No. of tons mined.....	Average value per ton at the mine.	Amount received for year's total output.....
		Strip.....	Drift.....	Slope.....	Shaft.....		Fan.....	Furnace..			Summer...	Winter...			Summer...	Winter...		Summer...	Winter...	Summer...	Winter...	Summer...	Winter...			
Beaako's mine											14 00	1				1	1	4	1		4	1	\$ 75	400	\$500 00	
Harriott Bros.											18 00	2				2	2	2	2		2	2	1 00	190	190 00	
Ledford, John											13 00	1				1	1	1	1		1	1	1 00	60	401 50	
Novinger, J. B.											13 6	2				2	2	2	2		2	2	1 00	60	595 00	
Pennsylvania Coal Co. }											13 8	2				2	2	2	2		2	2	1 00	60	5291 70	
Stahl											13 8	1				1	1	25	25		38	29	1 00	70	10405 00	
Kirkaville.											14 00	1				1	4	4	1		5	1	75	689	16405 00	
Scott, D. C. (Hazel Creek mine)											14 00	1				1	4	4	1		5	1	75	689	886 25	
Totals.....		1	2	2	1	4					500	1250 00	4	3	68	31	9	6	77	37	...	17110	1 64	28511 25

AUDRAIN COUNTY.

Audrain Mfg. & Coal Mining Co.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1</
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BARTON COUNTY,

[illegible]

Character, Tonnage and Value—Continued.

BATES COUNTY.

Name of firm, person or company.	Kind of power opening.	Kind of shaft.			Depth of shaft.	Kind of ventil'n		Diameter of fan.		Mode of work'g	Av. thickness of vein in ft. and in		No. of kegs powder used during the year.		Cost of powder for the year.		No. of mules.		No. of miners.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined.	Average value per ton at the mine.	Amount received for year's total output.
		Steam.	Horse.	Shaft.	Slope.	Drift.	Strip.	Furnace.	Fan.		Pillar and room.	Long wall.					Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.			
Baldwin, L.											3.2		10	\$ 23 00													400	1 10	\$ 440 00
Bruce, W.											3.6		150	300 00													6000	1 00	6000 00
Atton, F. H.											3.0		80	65 00													2400	1 00	2400 00
Farrar & Armstrong											2.8		80	65 00													500	1 12 1/2	500 00
Funk, Benjamin											2.8		150	307 50													500	1 12 1/2	500 00
Hines Bros											1.0		150	307 50													800	1 12 1/2	800 00
Hocker Bros.											3.8		108	900 00													400	1 00	400 00
Hopkins, S. W.											3.8		108	900 00													400	1 00	400 00
Hunt Bros											3.10		60	120 00													400	1 00	400 00
Jenkins' bank											3.60		60	120 00													400	1 00	400 00
Johnson, John											1.6		6700	10000 00													8000	1 00	8000 00
Keith & Perry Coal Co.											1.6		15	30 75													800	1 25	800 00
Marlin, W. H.											1.8		172	840 00													800	1 25	800 00
Marlin, M. K.											1.8		310	510 50													800	1 25	800 00
Misner Coal & Construction Co.											1.8		310	510 50													800	1 25	800 00
Lucas, W. W.											5.00		33	48 00													9437	1 25	11737 26
Parson, Peter											5.00		33	48 00													9437	1 25	11737 26
Rich Hill Coal & Mining Co., No. 3											1.00		4899	1247 50													2687	1 12 1/2	3233 75
Wethers, No. 3											1.2		3182	7880 00													88260	1 15	95000 00
Graham, Thos., No. 4											1.8		2802	5755 00													800	1 25	800 00
Mine, No. 13											13.10		6538	16332 50													800	1 25	800 00
Mine, No. 14											13.9		4707	11767 50													800	1 25	800 00
Barton & Cheney											13.10		3	20 00													800	1 25	800 00
Sim, J. J.											13.6		3	20 00													800	1 25	800 00
Martin, F. M.											15.00		1472	3630 00													800	1 25	800 00
Openings and strip-pets.											13.00		100	225 00													800	1 25	800 00
Raney, F. A.											2.6		100	225 00													800	1 25	800 00
Robinson, D. L.											2.6		100	225 00													800	1 25	800 00
Seawell, J. M. & Co.											2.10		100	205 00													800	1 25	800 00
Skillman											2.10		100	205 00													800	1 25	800 00
Springer & Gardner											4.00		10	6 15													800	1 25	800 00
Sullivan & Cheney											4.00		10	6 15													800	1 25	800 00

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BOONE COUNTY.

[illegible]

CALDWELL COUNTY.

Callwell Coal Co.	1	1	507	1	1	1.8	20	4	24	20	1 00	1600	1 75	2825 00
Hamilton Coal Co.	1	1	310	1	10	1.8	60	14	89	74	1 00	2118	1 80%	38249 00
Totals.....	2	2	817	1	1	5	95	80	118	94	.....	2266	1 80	40874 00

Character, Tonnage and Value—Continued.

CALLAWAY COUNTY.

Name of firm, person or company.	Kind of power.	Kind of opening.				Depth of shaft.	Kind of ventil'n.	Diameter of fan.	Mode of work'g.		Av thickness of vein in ft. and in	No. of kegs powder used during the year.	Cost of powder for the year.		No. of mules.	No. of miners.		Other empl.	Total empl.		Av. price per ton for mining.		Total No. of tons mined.	Average value per ton at the mine.	Amount received for year's total output.
		Shaft.	Slope.	Drift.	Strip.				Furnace.	Fan.			Long wall.	Pillar and room.		Winter.	Summer.		Winter.	Summer.	Winter.	Summer.			
Bishop, R. L. & Co.							1		1	1.8						8	4		8	4	41	100	1 00	400 2 00	\$ 800 00
Castle, Wm.		1				70			1	2	6					18	6		18	6	81	100	1 00	480 1 50	7035 00
Harris, A. & Bro						40				2	6					4	2		4	2	81	100	1 00	800 1 50	1300 00
Harris, John						50				1	8					1	1		1	1	81	100	1 00	560 1 75	980 00
Henderson, J. S.						55				1	8					10	10		11	11	111	100	1 00	3200 1 50	4800 00
Holmes, Adolphus.										1	2	4				1	1		1	1	16	2	0	16 2 00	33 00
Griswold, Warner										1	2	4				6	4		6	4	41	100	1 00	1807 1 50	1960 00
Lerner, R.						45				1	8	6				2	2		2	2	41	100	1 00	57 1 83 1/2	93 45
Guy, Wm.										1	2	6				1	3		1	3	11	12 1/2	1 12 1/2	987 1 75	1745 93
Nisycok, Samuel						40				1	8	6		\$ 4 50	2	1	1		2	1	24	0	1 75	240 1 75	450 00
Oldham, Wm.										1	2	8				14	2		16	2	21	06 1/2	1 06 1/2	3163 1 83 1/2	5140 68
Smith, James.																2	2		2	2				153 1 60	24977 08
Totals.							8					2	4 50			75	35	8	83	35					

CEDAR COUNTY.

Anderson, W. O.									12.6								2				2		1.00	1.00	180 1 50		270 00	
Cole, M. M.									1.8								5	5			5	5	1.00	1.00	1000 1 50		1260 00	
Daniels, Lee									12.3								1				1		1.00	1.00	4 1 50		6 00	
Davis, A. B.									2.00								3				3		1.00	1.00	80 1 75		140 00	
Totals.			13														11	5			11	5			1264 1 83		1686 00	

CHARITON COUNTY.

[illegible]

CLAY COUNTY:

[illegible]

COLE COUNTY.

ELSTON, F. M. & Co.....	1	1	135	1	75	150 00	6	8	7	7	12	10	2000	1 50	3000 00
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COOPER COUNTY:

Missouri Valley Coal & Mining Co.	1	1	64	1	1	10	6	8	2	13	7	90	2000 2 00
Palmberg, A	1	1	100	1	1	1	1	1	1	1	1	62½	200 2 00
Totals.	1	1	1	2	2	11	6	8	2	14	8	152½	2200 2 00

DADE COUNTY:

Leonard, A.	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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GRUNDY COUNTY:

Grundy County Coal Co.....	1	1	10	6	4	90	70	15	14	105	84.1	12%	1	06%	28983	1	54	53300	00
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Character, Tonnage and Value—Continued.

HENRY COUNTY.

Name of firm, person or company.	Kind of power opening.		Depth of shaft....	Kind of ventill'n		Diameter of fan...	Mode of work'g.		Av. thickness of vein in ft. and in.	No. of kegs powder used during the year		Cost of powder for the year		No. of mules.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined	Average value per ton at the mine..	Amount received for year's total output.....
	Steam	Horse		Furnace..	Fan		Long wall	Pillar and room		Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter					
Baldwin & Fonda.....	1		55				1	2.6	2.6					1	30	40	8	38	48	\$ 85	\$ 85	13200 1 40	\$ 18480 00	
Bode, H. H.....	1	1	33				1	3.6	3.6					1	10	5	3	2	7	25	1 25	1280 2 25	2767 50	
Cohen, S. B.....	1	1	82				1	3.6	3.6	20	\$ 45 00			12	12	5	4	14	16	85	85	1200 1 50	1800 00	
Co-operative Coal Co.	1	1	75				1	2.6	2.6	500	1000 00			25	25	4	4	16	16	35	85	1200 1 30	1520 00	
Dunlap Coal Co.		1						13.6	13.6	75	150 00			10	6	5	4	16	10	1 00	1 00	30000 1 60	45000 00	
Hobb, H. B.....	1	1	45					13.6	13.6	15	27 75			14	8	2	1	16	9	85	85	2210 1 40	3080 00	
Hurt, John.....	1	1						12.6	12.6	200	400 00			16	6			16	6			240 1 50	390 00	
Hurt, J. N.....	1	1						3.6	3.6	80	60 00			6				7	6			716 1 50	1074 00	
Kay Coal Co.....	1	1	60				1	2.6	2.6	1403	3153 75			5	80	60	30	110	68	85	75	4206 1 40	5591 00	
Keth & Perry Coal Co.		1						13.6	13.6	80	135 00			15	5	4	2	12	7	95	85	1712 1 50	2398 00	
McFadden & Evans.....	1	1	65					13.6	13.6	27	60 75			2	2	1	1	8	8	85	75	500 1 60	1250 00	
Noble, H. T.....	1	1						12.6	12.6					23	2			25				4316 1 40	4042 24	
Pigg, D. B. Coal & Mining Co.	1	1	25					12.6	12.6	50	100 00			1	10	8	1	11	31	25	1 25	10232 00	2045 24	
Owens, B. L.....	1	1	75					13.4	13.4	600	1230 00			4	75	50	15	90	60	95	85	16781 1 65	30437 87	
Thompson, John & Co.	1	1	35					12.4	12.4	377	640 80			1	35	25	7	42	30	1 00	90	6321 1 40	8849 40	
Woods & North Coal Co.	1	1	30				1	2.6	2.6	20	40 00			2	30	30	10	10	40	85	85	11660 1 40	16310 00	
Tebo Coal Co.....	1	1								3897	7194 65			15	12	318	103	501	367			144189 1 47	211834 01	
Totals.....	7	511	812	7	3																			

JASPER COUNTY.

Williams, A. W.....	1	1	24					1		32	68 50	1	1	4	2	1	1	5	3			633 1 50	940 50	
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JOHNSON COUNTY.

Boyd, Thos. H. & Co.	1	1	78					13.6	118	283 00	1	1	1	5	2	1	17	6	62%	62%	2600 1 50	3750 00
Bullock, D. A.	1	1						12.2				4	2				4	2	75	75	600 1 25	750 00
Doffmeier, J. T.	1	1						1.9	1				1				1				41 00	4 00
Evans, John B.	1	1	23					11.6				2	1	1			2		1 50		202 00	40 00

[illegible]

LAFAYETTE COUNTY.

[illegible]

Character, Tonnage and Value—Continued.

LAFAYETTE COUNTY—Continued.

Name of firm, person or company.	Kind of power.	Kind of opening.			Depth of shaft...	Kind of ventil'n		Diameter of fan...	Mode of work'g.		Av. thickness of vein in ft. and in.	No. of kegs powder used during the year	No. of mules.		No. of miners.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined	Average value per ton at the mine.	Amount received for year's total output
		Horse...	Shaft	Slope		Furnace.	Fan		Pillar and room	Long wall			Winter	Summer.	Winter	Summer.	Winter	Summer.	Winter	Summer.	Winter	Summer.			
Republican mine	1	1	1	1	25	1	1	1	1	1	1.7	1	1	1	12	2	1	1	12	2	21 12 1/2	1 00	1500	1 50	2250 00
Tate, John W.	1	1	1	1	44	1	1	1	1	1	1.4	1	1	1	9	1	1	1	9	1	1 12 1/2	1 00	400	1 60	648 00
Seawell, J. M. & Co.	1	1	1	1	45	1	1	1	1	1	1.8	1	1	1	32	12	3	1	35	15	1 12 1/2	1 00	4338	1 50	6500 00
Steady & Fowler Coal Co.	1	2	1	1	25	1	1	1	1	1	1.6	1	1	1	75	25	6	3	81	38	1 12 1/2	87 1/2	15000	1 91	28750 00
Walton, Thos.	1	1	1	1	35	1	1	1	1	1	1.8	1	1	1	10	8	2	1	12	9	1 12 1/2	1 00	3400	1 75	5869 00
Wellington Coal Co.	1	1	1	1	35	1	1	1	1	1	1.6	1	1	1	35	10	4	2	39	12	1 12 1/2	1 00	3677	1 60	5888 20
Wilks, J. E.	1	1	1	1	80	1	1	1	1	1	1.6	1	1	1	25	15	2	2	27	17	1 12 1/2	87 1/2	2400	1 75	4200 00
Winsor Coal Co.	1	1	1	1	40	1	1	1	1	1	1.6	1	1	1	80	30	14	9	94	39	1 06 1/2	87 1/2	12000	1 50	18000 00
Rocky Branch Coal Co.	1	1	1	1	1	1	1	1	1	1	1.6	1	1	1	50	25	5	3	55	28	1 06 1/2	87 1/2	4238	1 75	7505 75
Powell, E. B.	1	1	1	1	1	1	1	1	1	1	1.6	1	1	1	6	3	1	1	6	3	1 35	1 25	350	1 83	640 50
Totals.....	6	1822	323	1	.....	30	4	.....	.....	.....	.....	.....	28	171313	720	199	147	1512	867	.....	.....	352503	1 54	545551	17

LINN COUNTY.

Clark Coal Co.	1	1	1	1	140	1	1	1	1	1	12.00	1	1	1	9	8	2	2	11	5	1 25	1 25	9530	1 75	4400 00
Hause, Peabody & Co.	1	1	1	1	140	1	1	1	1	1	2.8	1	1	1	8	2	1	1	10	4	1 15	1 25	1339	2 10	2878 00
Kansas & Texas Coal Co.	1	1	1	1	200	1	1	1	1	1	2.1	800	2	2	65	70	15	11	80	8	1 10	1 40	2927	1 54	8487 08
Schaefer, Bernard	1	1	1	1	153	1	1	1	1	1	2.2	1	1	1	8	1	1	1	9	1	1 25	1 25	1500	1 77	2655 00
Totals.....	1	34	1	1	.....	2	1	.....	.....	.....	.....	800	2	2	90	77	20	14	110	91	.....	.....	25083	1 59	44680 09

LIVINGSTON COUNTY.

Cox, W. A.	1	1	1	1	80	1	1	1	1	1	1.5	1	1	1	6	2	2	1	8	8	1 25	1 25	200	2 25	450 00
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MACON COUNTY.

[illegible]

MILLER COUNTY.

[illegible]

MONITEAU COUNTY:

[illegible]

MONROE COUNTY.

[illegible]

MONTGOMERY COUNTY.

[illegible]

Character, Tonnage and Value—Continued.

MORGAN COUNTY.

Name of firm, person or company.	Kind of power.	Kind of opening.				Depth of shaft.	Kind of ventila		Diameter of fan.	Mode of work g.		Av. thickness of vein in ft. and in.	No. of mules.	No. of miners.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined.	Average value per ton at the mine.	Amount received for year's total output.
		Strip	Drift	Slope	Shaft		Fan.	Furnace		Pillar and room	Long wall			Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter			
Stover Coal Mines			1												1			1				363 12½	\$114 00	

NODAWAY COUNTY.

Carlew & Co			1	1									1.00						6						6		2.00		30		2.50	75 00
Dixon			1	1							1.14		1.14						6						6		2.00		280		2.50	700 00
Harris, Reuben			1	1							1.2		1.2						1						1		2.00		57		2.50	142 00
Holt, Wm.			1	1							1.10		1.10						2						2		2.00		15		2.50	37 50
Kealinger, Wm.			1	1							1.12		1.12						6						6		2.00		230		2.50	575 00
Nelson, G. W.			1	1							1.11		1.11						4						4		2.00		160		2.25	360 00
Nichols, Joseph			1	1							1.10		1.10						6						6		2.00		400		2.50	1000 00
Pearson, Samuel			1	1							1.12		1.12						3						3		2.00		180		2.50	450 00
Pearson & Co			1	1							1.10		1.10						4						4		2.00		150		2.50	375 00
Roberts, N			1	1							1.16		1.16						10						10		2.00		400		2.50	1000 00
Tarpley, Benjamin			1	1							1.1		1.1						4						4		2.00		320		2.50	800 00
Totals	5	5	6																52						52		9		2222		2.48	5505 50

PUTNAM COUNTY.

Blackbird Coal Co.			1	1									12.8						6						6		75		1011		1.25	1263 50
DeGarmo, G. E.			1	1							12.8		12.8						2						2		75		1102		1.25	1377 50
Gorman, Pat			1	1							13.00		13.00						2						2		75		800		1.25	975 00
Lane & Love			1	1							12.9		12.9						3						3		80		1011		1.35	1384 85
Mendota Coal & Mining Co., No. 1			1	1							12.10		12.10						6						6		70		89210		1.14	102485 06
Mendota Coal & Mining Co., No. 2			1	1							12.10		12.10						5						5		70		80747		1.18	96388 10
Pherigo, Martin			1	1							13.8		13.8						2						2				145		1.00	145 00
Totals	2	2	8																11						11				128298		1.16	149354 00

RAILS COUNTY.

Boulware, E. L.	1									2	1	2	1	2	1	75	350 00
Evans, J. S.	1									1	2	1	2	1	2	75	31 00
Russell, John.	1									2	4	2	4			860	720 00
Totals	3									5	7	5	7			614	1151 00

RANDOLPH COUNTY.

Burk, J. S.	1																160 1 25	200 00
Cooley, J. M.	1																400 1 25	500 00
Edwards, S. Emanuel.	1																780 1 41	1698 56
Elmore, T. M.	1																460 1 12½	558 85
Enterprise Coal Co.	1																1720 1 20	2062 00
Ferguson, Allen	1																180 1 50	270 00
Higbee Coal and Mining Co.	1																46200 1 25	56500 00
Interstate Mining Co.	1																74800 1 40	104720 00
Jones, Geo. W.	1																2022 1 25	2928 12
Lowes, John	1																2032 1 18	2900 00
Milburn, Joseph & Sons	1																780 1 50	1140 00
Mitchell, W. E. & Co.	1																2320 1 25	2900 00
Osage Coal and Mining Co.	1																1978 1 50	29677 50
Palson, John F.	1																220 1 25	275 00
Randolph County Coal Co.	1																2800 } 80	58000 00
																	70 } 80	
Williams, J. B.	1																1320 1 25	1650 00
Rutherford, H. L. & Son.	1																5800 1 18	7060 00
Totals	5	3	9	4	5					77	67	569	473				22476 1 18½	286422 77

RAY COUNTY.

Black Diamond.	1																6250 2 00	12500 00
Boward-Brown Coal Co.	1																8420 1 50	12630 00
Buchlinger, Fred.	1																424 2 00	848 00
Sater & Co. (Climax No. 1)	1																240 2 50	600 00
Craven Coal Co.	1																688 1 00	1038 50
Darneal Coal Co.	1																10220 1 50	16380 00
Dickson, H. A.	1																440 2 00	880 00
Douglas & Moore.	1																2500 2 00	5000 00
Hartwell, Arnold & Co.	1																1000 2 00	2000 00
Hubbell Mining Co.	1																15000 1 50	22500 00

Character, Tonnage and Value—Continued.
RAY COUNTY—Continued.

Name of firm, person or company.	Kind of power.	Kind of opening.				Depth of shaft...	Kind of ventil'n		Diameter of fan...	Mode of work'g.		Av. thickness of vein in ft. and in.	No. of kegs powder used during the year	Cost of powder for the year	No. of mules.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined	Average value per ton at the mine.	Amount received for year's total output.....		
		Shaft	Slope	Drift	Strip		Furnace	Fan		Long wall	Pillar and room...				Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer				Winter	Summer
Hubbell, Hyatt & Hubbell	1	1		1		115	1			12.6		12.6				8	2	100	65	20	10	75	1.00	25000	1.50	37500.00	
Huston, Joseph	1	1		1		72		1	12	11.9		11.9				7	123	87	29	81	152	118	1.12	3301.75	577.50	56938.23	
Kansas & Texas Coal Co.	1	1		1						11.10		11.10				4	1	1	1	1	1	1	1.00	149.2	308.00	298.00	
Kauersberger's Mine	1	1		1						11.4		11.4				2	1	1	1	1	1	1	1.25	120.2	240.00	240.00	
McCorkendale, John	1	1		1						11.7		11.7				4	1	1	1	1	1	1	1.25	120.2	240.00	240.00	
McKendall, Robert	1	1		1						11.6		11.6				2	1	1	1	1	1	1	1.25	688.3	1376.00	1376.00	
Phillips, Wm.	1	1		1		107	1			11.10		11.10				23	16	5	6	27	22	21	1.00	5280	5416.00	5416.00	
Pickering, Joseph, Coal Co.	1	2				50				11.0		11.0											1.00				
Richmond C. Co. (3 m. at Camden)		1	4		1	100	3	1	12	12.00		12.00				10	10	415	280	70	50	435	340	1.00	1509121	240775.93	240775.93
" " (4 m. at Richmond)	5	1		1						11.7		11.7				2	2	1	1	2	1	1	1.30	800	1400.00	1400.00	
Scrivens, Wm.										11.8		11.8				4		30	25	4	1	4	1	1.25	125.2	250.00	250.00
Sickels, Wm.	1	1		1		95				11.6		11.6				30	25	4	4	34	29	1	1.00	7281	10846.23	10846.23	
Williams, R. J., Coal Co.							1			11.8		11.8				2	2	38	22	9	4	47	26	1.00	8333	13905.00	13905.00
Rankin, W. D. & Co.																24	21	958	533	180	116	1138	1.00	239247	1.53	446580.41	
Totals.....	11	7	18	10			15	2																			

SALINE COUNTY.																											
Alexander, Frank	1	1		1						1		1												2002.50	500.00		
Aus, T. F.		1		1						12.00		12.00											4	1	50		
Beard, W. N.		1		1						1.8		1.8											4	1	1.25		
Briggs, Isaac		1		1						1.6		1.6											16	6	1.25		
Briggs, Isaac		1		1						1.6		1.6											7	1	1.00		
Bridgers, Wm. S.		1		1		41				1.6		1.6											7	1	1.00		
Brodzinski, Ed.		1		1						1.6		1.6											6	2	1.00		
Brown, H.		1		1						1.6		1.6											7	1	1.00		
Barney, H.		1		1		60				2.00		2.00	100	235.00									9	1	1.25		
Byham, H.	1	1		1						1.6		1.6											7	1	1.00		
Esther, Wm.		1		1						1.6		1.6											5	1	1.25		
Terrell, John W.		1		1						1.6		1.6											5	1	1.00		
Thompson, R. P.		1		1						1.6		1.6											8	2	1.00		
VanBaskirk, A.		1		1		80				1.6		1.6											6	3	1.00		
Willburn Coal Co.	1	1		1																			1	8	1.75		
Totals.....	1	2	3	6			8						100	235.00													
																54	19	14	6	68	25				7981	1.94	14644.00

SALINE COUNTY.

Alexander, Frank																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</
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SCHUYLER COUNTY.

James, W. F.	1			13.8			6		20	802.50	200.00
Mock, T. J. & Sons	1			13.8			8		1.00	200.125	250.00
Totals	1	1					9			280.160	450.00

SHELBY COUNTY.

Yost, W. T.	1			1.00			1			82.00	16.00
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SULLIVAN COUNTY.

Milan Land & Coal Mining Co.	1	190		13.6			13	8	15	70	560.2.00	1120.00
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ST. CLAIR COUNTY.

Bidler, F. M.	1			12.6			4	2	1	6	31.00	1.00	801.50	120.00
China, John	1			11.6			6	2	1	6	31.25	1.25	400.2.00	500.00
Johnson, J. M.	1			12.00			1	1	1	1	11.00	1.00	160.1.50	225.00
Owen Coal Co.	1			13.00			35	7	8	48	7.80	75	3048.1.50	4672.00
Vannice, G. A.	1			13.6			2	1	1	2	1.85		133.1.50	200.00
Watkins, Wm.	1			12.8			2	1	1	2	11.00		20.1.50	30.00
Wilson, R. B.	1			13.8			4			4	1.00		35.1.50	52.50
Totals	1	52					52	14	11	2	63	16	3363.1.55	5999.50

VERNON COUNTY.

Allen, R. E.	1			4.00			1	3	8	2	1	5	4	87%	87%	2737.1.30	3308.40
Brown, John & Bro	1			1.2												482.3.00	564.00
Burks, C. M.	1			2.00												325.2.00	650.00
Burton, W. C.	1			1.2												25.1.25	31.25
Crawford, G. B.	1			2.00												200.1.75	350.00
Davis, Joseph	1			4.00												384.3.00	768.00
Devoore, J. M.	1	35		13.6			10	6	8	1	13	71.00				233.1.50	345.00
Dickson Mine	1			1.8			15		6	6						400.1.50	600.00
Downing, E. S.	1			1.2												100.1.50	150.00

Character, Tonnage and Value—Continued.

VERNON COUNTY—Continued.

Name of firm, person or company.	Kind of power opening.	Depth of shaft.	Kind of ventil'n	Diameter of fan	Mode of work'g.	Av. thickness of vein in ft. and in.	No of kegs powder used during the year.	Cost of powder for the year	No. of mules.		No. of miners.		Other empl.		Total empl.		Av. price per ton for mining.		Total No. of tons mined	Average value per ton at the mine.	Amount received for year's total output
									Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter			
Every, Milton						1 2	12	\$27 00											402 00	\$80 00	\$80 00
Ferry, B. E. & W. T.						3 00	200	450 00											800 75	1400 00	1400 00
Finley, L.						1 3 2	200	450 00											2400 1 87 1/2	3300 00	3300 00
Frank, A. H.		65				1 4													120 1 35	150 00	150 00
Gill, J. F.						1 6													240 1 25	300 00	300 00
Green, Edward						4 00													320 1 50	450 00	450 00
Gonterman, W. G.						1 2 6													120 1 60	180 00	180 00
Highower, J. H.						1 00													3 2 00	6 00	6 00
Hill, Willis D.						1 3 8	200	480 00											4860 1 50	7200 00	7200 00
Hoss, G. S.		25				3 6	500	825 00											12000 1 12 1/2	3500 00	3500 00
Hunter, E. N.						1 8													200 75	350 00	350 00
Johnson, H. D.						1 00													500 1 60	800 00	800 00
Larkin, W. E.						1 2													200 1 25	250 00	250 00
Linn, Co.						1 3													100 1 25	125 00	125 00
Lucas, J. C.						1 00													80 1 60	125 00	125 00
Moore, John						1 8													80 1 60	125 00	125 00
O'Bryan, Wm. & Co.						3 6	600	1000 00											14000 1 12 1/2	16750 00	16750 00
Potter, Samuel						1 8													20 2 00	240 00	240 00
Powell, W. S. Coal Co.						1 3 6													120 1 60	180 00	180 00
Prewitt, W. H.		18				1 2													100 75	175 00	175 00
Robinson, W. D.						1 2 6													250 1 75	487 50	487 50
Salaman, J. B.		30				4 00	400	820 00											11200 1 12 1/2	12600 00	12600 00
Smith, Peter						1 6													15 2 00	30 00	30 00
Yadon, T. A.						1 2													860 1 75	630 00	630 00
Wright, J. D.						2 6													20 2 00	40 00	40 00
Seawell, J. M. & Co.						6 00	4	8 40											10500 1 25	13500 00	13500 00
Pope, S. O.																			400 1 07	429 05	429 05
Totals	1						1900	\$777 50	2	2	94	32	63	9	157	41			64308 1 24	79540 20	79540 20

TABLE V—Showing Coal Output by counties, according to their tonnage, value per ton, No. of large and small Mines in operation.

Counties.	Product in tons.	Av. price per ton.	No. mines reported.	
			Emp 10 or more men	Empl less than 10.
Bates.....	726,273	\$1 05	19	23
Macon.....	454,029	1 27	13	1
Lafayette.....	352,603	1 54	32	16
Ray.....	282,247	1 58	18	10
Randolph.....	224,758	1 18½	6	13
Henry.....	144,139	1 47	15	2
Putnam.....	123,526	1 16	3	4
Vernon.....	64,303	1 24	5	31
Barton.....	63,626	1 45	4	35
Grundy.....	28,983	1 84	1	.....
Linn.....	28,036	1 59	3	1
Boone.....	23,577	1 46	3	17
Caldwell.....	22,661	1 80	2	.....
Audrain.....	19,569	1 53	1	10
Adair.....	17,110	1 64	2	5
Callaway.....	15,581	1 60	3	9
Montgomery.....	13,124	1 36	1	1
Johnson.....	10,530	1 62½	1	14
Clay.....	8,289	1 80	1	.....
Saline.....	7,981	1 84	1	12
St. Clair.....	3,866	1 55	1	6
Dade.....	3,402	1 69	1	5
Nodaway.....	2,222	2 48	1	10
Cooper.....	2,200	2 00	1	1
Cole.....	2,000	1 50	1	.....
Cedar.....	1,264	1 32	.....	4
Chariton.....	1,170	2 00	1	2
Jasper.....	633	1 50	.....	1
Ralls.....	614	1 84	.....	3
Sullivan.....	560	2 00	1	.....
Moniteau.....	476	2 00	.....	1
Schuyler.....	280	1 60	.....	2
Livingston.....	200	2 25	.....	1
Miller.....	130	2 50	.....	1
Morgan.....	36	3 12	.....	1
Monroe.....	12	2 00	.....	1
Shelby.....	8	2 00	.....	1
Totals.....	2,650,018	1 31½	141	244

TABLE VI.—Comparative Table of Tonnage and Value of Output of Coal Mines for 1889, 1890 and 1891.

Counties.	No. of tons mined.			Value of output.		
	1889.	1890.	1891.	1889.	1890.	1891.
Adair.....	16,532	14,840	17,110	\$27,980	\$24,379	\$28,511 25
Audrain.....	22,298	22,813	19,569	36,497	30,117	30,038 97
Barton.....	122,664	65,097	63,626	153,542	83,818	92,179 94
Bates.....	729,633	671,373	726,273	755,278	713,039	762,740 88
Boone.....	9,944	21,302	23,577	14,916	31,172	34,574 50
Caldwell.....	26,074	17,074	22,661	54,571	34,660	40,874 00
Callaway.....	12,633	18,355	15,581	19,677	30,517	24,877 03
Cedar.....			1,264			1,666 00
Charlton.....		120	1,170		240	2,340 00
Clay.....		5,036	8,289		7,554	14,920 20
Cole.....			2,000			3,000 00
Cooper.....	1,027	1,594	2,200	1,640	3,511	4,400 00
Dade.....	2,290	1,400	3,402	3,907	1,960	5,718 50
Grundy.....	18,000	23,593	28,983	35,000	48,366	53,300 00
Henry.....	210,376	127,281	144,139	217,694	193,221	211,834 01
Howard.....		4,000			5,600	
Jasper.....			633			949 50
Johnson.....	12,803	13,187	10,530	21,713	21,113	17,100 50
Lafayette.....	320,448	329,845	352,603	536,997	508,743	545,551 17
Livingston.....		1,100	200		2,250	450 00
Linn.....	2,136	13,403	28,036	4,272	21,720	44,630 09
Macon.....	223,660	457,896	454,029	309,443	585,925	576,678 51
Miller.....		87	130		218	325 00
Moniteau.....			476			954 00
Monroe.....		108	12		163	24 00
Montgomery.....	10,003	14,744	13,124	14,769	21,595	17,753 40
Morgan.....	496	240	36	1,240	480	114 00
Nodaway.....			2,222			5,504 50
Putnam.....	75,877	91,584	123,526	107,581	116,883	143,554 00
Ralls.....		675	614		1,020	1,151 00
Randolph.....	184,609	245,893	224,758	272,244	318,833	266,422 77
Ray.....	207,829	240,462	282,247	324,740	387,346	446,860 41
Saline.....	832	660	7,981	1,872	1,265	14,664 00
Schuyler.....		300	280		375	450 00
Shelby.....		40	8		80	16 00
Sullivan.....			560			1,120 00
St. Clair.....			8,866			5,999 50
Vernon.....	13,313	33,292	64,303	14,841	38,188	79,540 20
Total.....	2,223,477	2,437,399	2,650,018	3,030,414	3,234,351	3,480,866 83

ACCIDENTS IN COAL MINES.

It is not very pleasant to have to note such an increase of casualties as have occurred during the past year as compared with the report of 1890. That report shows 28 non-fatal and 10 fatal accidents, while this report for 1891 shows 50 accidents of all kinds, 18 of which proved fatal, an increase over 1890 of 8 fatal and 4 non-fatal. An examination of the table reveals the fact that 34 of these accidents, or 60.8 per cent, were caused by falling roof or coal, 7 by blasting, 2 by coupling cars, 2 by cages and the remainder from different causes; a detailed statement of the more important accidents will be found herein.

The Commissioner of Labor for the State of Illinois has compiled a statistical table from the Mine Inspector's reports, showing the number of casualties in and about mines of said State during the past eight years which, gives an average of 64.5 per cent of the accidents as having been caused by falling roof or sides.

While the accidents from falling roof and coal, in our State, seem large, yet it compares favorably with the report of Illinois, which shows nearly 4 per cent more accidents from this cause than our report.

John Lewis	“	“	38	1	“	Hips and legs hurt by falling roof	Unforeseen accident.
Paul Bice	“	“	26	1	“	Killed by falling roof	
Totals			2	F 2 0			
Henry county.							
Woods & North Coal Co.							
Wm. Knisk	Brushing roof.		21	1		Falling roof	
Hagman & Eaton	Miner		22	1		Holisting rope broke	
Keith & Perry Coal Co.	“		37	4	1	Ear partly torn off by falling roof,	
Totals			1	4 1 3			
Johnson county.							
James B. Evans	Miner		59	1	8 1	Killed by falling down shaft which had no protection.	Accidental.
Lafayette county.							
Lexington Coal Mining Co.	Miner		24	1		Ankle crushed by falling coal	
Excelsior Coal and Coke Co.	“		“	1		Ankle broken by falling roof	
Henry Mackey	“		“	1		Hurt by falling coal	
Hartman & Gilbert	Foreman		24	1	1	Killed by foul air	
Totals			1	1 1 3			
Macon county.							
Thos. Wardell	Helper		17	1		Leg broken by falling roof	
Loomis & Snively	Miner		“	1		Falling roof	
“	“		48	1		“	
Kansas & Texas Coal Co.	Cager		34	1	4 1	Caught bet. cage and cribbing	
“	Miner		28	1	1	Killed by falling roof	
“	“		43	1	6 1	“	
“	Day man		“	1	1	Seriously hurt by falling roof	
Totals			2	1 10 3 4			
Montgomery county.							
Vandalla Coal Co.	Miner		47	1		Collar bone broken: falling coal.	
“	“		17	1		Ankle sprained by falling coal.	
Totals							

Table Showing Accidents in Mines—Continued.

Name of employer.	Name of employee.	Occupation.	Amount of insurance.....		Nature of accident.	Coroner's verdict.
			Was employee insured?	No. Yes..		
			Non-fatal			
			Fatal			
			No. of children			
			Single			
			Married			
			Age			
<i>Randolph county.</i>						
Randolph County Coal Co.	Jarvis Wild	Miner	38	1	Killed by falling roof	Carelessness of deceased.
" " " "	Tony Detinne	" "	34	1	Hand mashed by falling roof	
" " " "	Wm. Williams	Cager	1	1	Killed between cage and curbing	
Higbee Coal and Mining Co.	Jas. Burnes	Roadman	30	1	Finger broken by falling roof	
Totals			1	6	2	
<i>Ray county.</i>						
Richmond Coal Co.	John Watson	Miner	31	1	Killed by falling roof	Leg broken, ankle mashed
Hubbell, Hyatt & Hubbell	Jesse Phillips	" "	40	1		
Totals			1	3	1	
Total casualties for State			11	7	41	18

The following general remarks on accidents refer more especially to those of a serious nature occurring during past year:

BATES COUNTY.

L. W. Brooks, a colored boy, 14 years of age, was instantly killed by a fall of slate in mine No. 5, owned and operated by the Keith & Perry Coal Co. The accident occurred March 31, in a room on the west side of shaft. It had not been driven in more than 25 feet from the entry, and was not more than 10 feet wide.

It seems from the evidence collected, that the room had been standing idle for some time prior to the accident; George W. Brooks, father of deceased, was to have commenced work in it as soon as a switch could be laid in the room. He was employed taking up the bottom in the mouth of the room preparatory to laying the switch. But before commencing his work he had set the drilling machine and started the unfortunate boy drilling a shot-hole in coal at face of room.

He stated to us that he examined the roof, and thought it was all right, before starting the boy to work. Deceased had just about completed the shot-hole when the mass of slate, weighing one-half ton or more, fell upon him with the result as stated above.

After making a careful examination of the place, and taking testimony of the parties who were present at the time, I am of the opinion that it was an accident which might have been avoided, had the boy's father made a more thorough examination of the room and used proper judgment in timbering it.

Following is the verdict of coroner's jury:

After having heard the evidence, and upon full inquiry concerning the facts and a careful examination of said body, do find that deceased came to his death from being caught under a fall of white top, while drilling a hole for the purpose of blasting coal, and that according to the evidence given in the case, the accident could have been avoided should proper care have been taken by Geo. W. Brooks (father of the boy).

Given under our hands at mine shaft No. 5, in the county of Bates aforesaid, this first day of April, 1891.

W. S. Beavers, foreman; A. C. Harding, S. S. Allen, Robert Brown, I. C. Reffert, George Ellis.

January 9.—Webster Blankenship, a young man 17 years of age, was instantly killed, and his father, Z. Blankenship, lost three fingers by fall of slate in mine No. 13, owned and operated by Rich Hill Coal and Mining Co.

Deceased and his father were working in a room together, and had fired a shot at noon (it is the custom in this mine to fire shots at noon), and on returning to work at 1 o'clock, the slate fell with the result as stated above.

Doubtless the shot had knocked out a prop or two, and probably loosened the roof. From the evidence collected the accident was unforeseen.

John A. Blanton, being duly sworn, states "young man Webster Blankenship came to his death by stone falling on him, was in his room previous day and sounded some rock with pick, * * * and spoke to his father about timbering room, but did not consider it dangerous; believe the shot at noon knocked the props out; do not think any one can be to blame; was purely an accident, and truthfully say, cannot throw the responsibility on any one. There was plenty of props in Blankenship's room."

Verdict of coroner's jury is as follows:

Do find that deceased came to his death from the falling of a stone from the roof in his place of working in the Rich Hill Coal Co.'s mines; that it was purely accidental, and caused by his own neglect, by going into his place of work too soon after firing shot.

M. Hendrick, foreman; Wm. Bows, A. E. Martin, Wm. Roberts, V. D. Frost, John Chaison.

October 7.—Thos. Colbert and Rufus Whitten were killed by the explosion of a shot in Mine No. 2, owned and operated by the Rich Hill Coal Mining Co.

The accident occurred in a room connected with the 5th north entry. The miners were loading a shot to be fired at noon, when last seen before the accident. Just how it occurred will probably never be known; but it is supposed that they either got bewildered by the dense powder smoke in the room, until the shot exploded, or returned to the room, doubtless thinking that it had missed fire, only to meet death, however; they were found in the room at 1 o'clock in a dying condition, half buried beneath the mass of coal.

It seems, from the information collected, that the miners had a practice of firing their shots at noon and night. When the signal was given, every miner that had a shot ready fired it, regardless of those working near by; consequently, those working near heads of entries sometimes had to encounter great volumes of smoke; this method, however, has been abolished, and the shots are now fired at intervals, commencing on the return air-way, and fired in regular order around the workings, to the inlet air-current. In this way the men are able to fire their shots and come out to the bottom of the shaft without running any risk or interfering with one another, and, as the firing is in reverse order to the direction of the air-current, the powder smoke and foul gases are carried to the up-cast without coming in contact with the men. No inquest was held over the bodies.

December 6.—S. C. Tooker, weigh-master at Mine No. 4, operated by Thomas Graham, was injured by being caught between two cars in

such a manner as to cause death twelve days after the accident. It seems that deceased was attempting to let off the brake on car, when another car, which had been started by the car trimmer, caught him with the result stated above.

January 27.—An accident occurred in a small mine on Russell Brayton's farm, near Amoret, by which Hamilton Willis and William Leith were instantly killed by fall of slate. It seems that on returning to their work after a shot had been fired, and while removing the coal from same, the roof gave way and fell upon them with the result stated.

An inquest held January 27, 1891, in Home township, Bates county, Missouri, by A. H. Lamb, justice of the peace, returned the following verdict:

We, the undersigned jurors, find that William Leith and Hamilton Willis came to their death by the falling of the roof in the mining bank of Russell Brayton, in Bates county, Missouri, about 1:30 p. m., January 27, 1891; and according to the evidence adduced, we find the accident to have been unavoidable, and was not due to the neglect of any one.

Wm. M. Lyle, foreman; Thos. Reed, R. A. McWilliams, J. D. Matthews, J. Hall, J. R. Martin.

February 19, an accident occurred in mine No. 2, owned and operated by the Rich Hill Coal Mining Co., in which I. N. West, A. E. Yarger, Charles Holmes and S. H. Ferguson were burned by the flame from a shot which had been fired by I. N. West, in room No. 21, on 5th north entry.

Messrs. West, Holmes and Ferguson were only slightly burned; therefore, were back at work in a few days after the accident. Mr. Yarger's burns were of a more serious nature, sufficient to keep him from work for several weeks.

It was thought by some that a keg of powder had been left near the shot by some careless miner, which was exploded by the fire from the shot, but I could not find sufficient evidence to substantiate it.

Charles Holmes stated:

"We were all standing between rooms Nos. 20 and 21, and about 100 feet from the shot when it fired. In a second the flames came rolling out of both rooms (Nos. 20 and 21). We fell to the floor on our faces, thereby avoiding the worst of the fire; but after a few seconds it got so hot we ran out the entry to fresh air. I do not know what caused the fire."

Such accidents as this should caution all miners and mine operators to observe section 7077 of the Revised Statutes, which requires all explosives to be kept in boxes, and not less than 100 feet to the shots that are to be fired.

CALDWELL COUNTY.

April 3 William Goin was killed by fall of rock in the mine operated by Hamilton Coal Co.

It seems that the accident occurred while deceased was sledging down coal.

June 24, an accident occurred in the Caldwell Coal Co.'s mine, in which Paul Bloice was killed, and Jno. Lewis, Frank Dooley, Robert Stewart and Wm. Hall were injured by fall of slate.

Men were employed taking down the roof and timbering the main entry.

They had only put up one or two sets of timbers, and were not more than 10 feet from the shaft bottom, when the roof gave way without the slightest warning, falling upon the unfortunate men with the results as stated above. The evidence taken before coroner's jury, and also before me, goes to show that the roof was sounded a short time before the accident, and considered safe.

Following is verdict of coroner's jury :

Do find that the deceased came to his death by a stone or slab of soapstone falling from the roof of the mine and upon the body of the said Bloice, killing him almost instantly, the weight of said stone being several tons, which fell upon and lay across the lower portion of the body ; that the deceased died where the accident occurred, the body having been crushed in a vital part, and which the jury do find caused the immediate death of said Paul Bloice ; and we further find from the evidence adduced, that no blame or fault can be laid upon or attached to the Caldwell Coal company or its management for the occurrence of said accident.

H. Farbee, foreman ; Taylor Allen, R. L. White, Henry Boroff, S. F. Martin, Oliver Austin.

JOHNSON COUNTY.

November 18.—Jeff. Estes, dead body was found at the bottom of shaft known as Evans coal mine. It is not known how the accident occurred, but it is supposed that deceased was either coming out or going into said mine when he lost his balance and fell to the bottom with the result as stated above.

Coroner's verdict is as follows :

Do find that the deceased came to his death by accidentally falling from top to bottom of shaft of aforesaid coal bank, a distance of 22 feet, from which fall said Jeff. Estes then and there died ; and so we the jurors do say said Jeff. Estes, in manner and by means aforesaid, came to his death, and not otherwise.

Jno. G. Scroggs, foreman ; J. W. Gossett, William Anderson, W. V. Anderson, J. H. Smith, A. J. Harrison.

LAFAYETTE COUNTY.

June 15.—R. T. Gordon lost his life by being overcome by foul air in Hartman & Gilbert's mine.

It seems that on that morning deceased went down the shaft to the furnace, which is located about 108 feet east of main hoisting shaft, to start fire, which was his custom, and a part of his duty. After being gone a few minutes he returned to the bottom in the dark and asked one of the miners for some more matches; after receiving the matches he returned to the furnace. When found, about one-half hour later, he was lying about 20 feet west of the furnace dead.

The evidence taken before the coroner goes to show that deceased was mining boss for the company, and that it was his duty to keep fire in the furnace in order to properly ventilate the mine. It furthermore shows that when a proper fire was kept in furnace, the mine was well ventilated, but when it was neglected for a day or two, black-damp accumulated in dangerous quantities.

I was told that deceased had been partly overcome by foul air two or three times before, while relighting the fire after it had been out for a day or two.

From the information I collected and the statements made before the coroner's jury, I am of the opinion that deceased lost his life by his own carelessness.

Following is coroner's verdict:

We, the jury, after examining into the cause, from the evidence find that R. T. Gordon came to his death from the effect of foul air while engaged in work in Hartman & Gilbert's coal mine.

J. A. Lockhart, foreman; H. H. Limburg, J. F. Larkin, D. S. Sisk, T. A. Charton, F. Snider.

MACON COUNTY.

November 24.—Wm. Leonard, a miner, was injured by fall of slate in Mine No. 26, owned and operated by the Kansas & Texas Coal Co., in such a manner as to cause death December 16th. The accident occurred in deceased's own room, which had only been driven in about 25 feet from the entry. The room was, at the time of our examination, several days after the accident, reasonably well timbered, but the roof was not good, owing to a fault which had been struck.

April 23.—Bruce Gaunt was instantly killed in Mine No. 43, located near Bevier, owned and operated by the Kansas & Texas Coal Co., by being caught between cage and curbing.

It seems, from the evidence taken before coroner's jury and statements made to me by the superintendent, that deceased was pushing an empty car off of the cage at bottom of shaft, when check-weighman rang the bell to the engineer to hoist cage, thinking, doubtless, that the cager had rung to hoist.

The evidence of check-weighman is as follows:

Q. Did you ring signal to the engineer? A. Yes, sir; I was certain he had rung from the bottom at the time.

Q. Was it your duty to ring signal? A. No, sir. I am not in the employ of the coal company, but helping the coal company's weighman for accommodation, when he is alone. I had no ill-feeling toward Bruce Gaunt. I have been asked heretofore to ring the bell. I and the weighman put car on the cage; weighman handed me the check and turned off; I rang the signal to the engineer and then started to hang up the check; the next thing drawed my attention was the weighman running to the bell-wire; weighman hollowed down to Bruce Gaunt; answer from bottom came, "Bruce Gaunt is on the cage!"

(Signed)

ELI RACKMAN.

The verdict of coroner's jury is as follows:

We, the jurymen, find from the evidence that Bruce Gaunt came to his death through a mistake of the check-weighman, Eli Rackman.

J. W. Thomas, E. J. Reynolds, Thomas Miles, Wm. Hardester, J. E. Frame, C. W. Chitwood.

May 6.—James W. Turner was killed by fall of slate in Mine No. 27, owned and operated by Missouri, Kansas & Texas Coal Co.

The evidence taken before the coroner's jury shows that deceased was killed in his working place and within a few feet of the face of coal.

Coroner's verdict is as follows:

ARDMORE, Mo., May 7, 1891.

We, the jury find from the evidence that J. W. Turner came to his death by a fall of a rock, caused by not having it sufficiently propped.

G. W. Dinsmore, John Johnson, Jos. Hardester, E. W. Johnson, D. A. Collins, Andrew Hardester.

April 9.—William Williams was instantly killed in mine No. 1½, operated by John Breckenridge, by being caught between cage and the curbing of the shaft. It seems that deceased had signaled the weighman to change cages, and he in turn signaled the engineer, who was out of the engine-room at the time; hence it was a minute or two before engineer got to his engine and started to change the cages; in the mean time James Vaughn, the roadman, asked Mr. Williams to help him push a box up to the cage, and deceased started across the cage to assist Mr. Vaughn just as the engineer started the engine, with the result as stated above.

Shaft No. 1½ is practically a new mine, having been sunk less than one year ago. It was inspected by me February 16, and I found that the company had no roadway around the shaft bottom—that is, no

practicable roadway—hence any one desiring to pass from one side of the shaft to the other had to either pass under one cage or over the other. I notified the superintendent of the fact and requested him to have a roadway made.

April 7.—I again visited the mine and explained to the mining boss the necessity of the passway around the shaft bottom, but it was not made at the time of the accident.

I do not state that this man's life would have been saved if there had been a roadway around the shaft bottom, but do say, that if there had been he could have passed around the cages in perfect safety. All shafts should have a roadway, at least 3 feet wide, and as high as the timbering in bottom, from one side of shaft to the other, and there should be a law compelling mine operators to make such roadways.

The verdict of coroner's jury is as follows:

We, the jury, find that the deceased, William Williams, came to his death by being caught between cage and curbing, by his own carelessness, after giving the signal to hoist.

C. B. Dysart, J. P. Davis, A. M. McCurry, W. H. King, J. W. Haynes, Joe Parish, jurors.

RAY COUNTY.

November 12.—John Watson was killed by fall of rock in his working place, in mine No. 3, owned and operated by Richmond Coal Co. J. S. DeMastus, justice of peace, acting coroner, writes:

This is to certify that after due inquiry as to the cause of John Watson's death, a miner, at Mine No. 3, on Wednesday, the 12th day of November, 1890, and in Ray county, Missouri, do find from statements made by parties on the ground when said accident happened, that the holding of an inquest was and is entirely unnecessary.

(Signed)

J. S. DeMASTUS, J. P.

Mr. J. S. Hughes, president of the company, said to me, "we have been operating mines for the past 20 years, and this is the first serious accident that has occurred during that time."

VERNON COUNTY.

The following report of accident occurring since June 30, 1891, does not properly belong to this report.

Yet, from conclusions, we have arrived at as to the probable cause of accident, and deeming the same of interest to some, we embody herein a copy of our special report made to the Labor Commissioner.

OFFICE OF STATE MINE INSPECTOR, }
JEFFERSON CITY, Mo., October 19, 1891. }

Hon. W. C. HALL, Com'r of Labor, Jefferson City, Mo. :

SIR—I herewith submit to you the following report of my investigation of the explosion which occurred October 7, near Rich Hill, Mo. The explosion took place in mine No. 7, located about three miles south of Rich Hill, owned and operated by Keith & Perry Coal Co.

The shaft was sunk about one year ago, but owing to some trouble in securing right of way, no railroad connection was made until July, and the first coal was hoisted about the 29th of same month, hence the underground workings are not very extensive. The coal in mine No. 7 is about 4 feet in thickness, and worked on the double-entry pillar and room plan, and was at the time of the explosion giving employment to 71 miners, 23 day men and 8 mules, and was loading about 25 to 27 cars of coal (run of mine) per day.

The surface plant is well arranged for convenience, economy and safety of working, and the machinery and appliances for hoisting the coal and ventilating the works are of ample capacity for a mine of this character. The hoisting engine is double cylinder, 14 by 20 inches, and drum about 6 feet in diameter, the engine shaft being geared to the drum shaft 3 to 1.

Ventilation is produced by a ten-foot ventilating fan which sets in the upcast airway at the shaft landing, and is designed to run up to 150 revolutions, furnishing about 40,000 cubic feet of air per minute. The coal is brought to the surface through a main vertical hoisting shaft 130 feet deep, divided by partitions into cage-ways. The upcast or ventilating shaft is bratticed off from the main hoisting shaft by wooden brattice work, and is 7 feet by 4 feet 3 inches in the clear, with wooden chimney extending 36 feet above the landing.

I arrived at the mine on the morning of the 9th, and found the shaft badly wrecked, the buntons having been blown out from between the cage-ways to within 15 or 20 feet of the bottom, and about 30 or 40 feet of the wooden brattice between the hoisting shaft and ventilating chamber also blown out.

The cages used in hoisting the coal are built of heavy oak timber and iron and weigh at least 2,500 pounds each. By the force of the explosion, the cage standing on the bottom at the time was shot up into the head-house, a distance of 160 feet, and was completely wrecked. The explosion having occurred after the miners had quit work, only two men were in the mine at the time, those two being special men employed after the custom of the company in firing shots, and are known as shot-firers. They were so engaged when the accident occurred, one of whom, W. R. Metz, was killed, and the other, Amos Algier, seriously injured. The eight mules in the mine were all killed and were being taken out on my arrival. As soon as they were removed we entered the mine by being lowered in a tub. We found loaded cars at the bottom in all conceivable shapes, some broken, others thrown cross-wise of the track, and one fully loaded was bodily lifted and set upon the top of another. Timbers and heavy stoppings were also blown out, thus showing the terrific force of the explosion. If all the miners had been in the mine at the time, nothing less than a miracle would have prevented the death of 60 or more men.

We made only a partial inspection of the mine, owing to the great amount of after-damp encountered; hence the investigation was deferred until ventilation could be restored. Monday, 12th, I again visited the mine and continued the examination, the ventilation having been partly restored, and found that all the shots had been fired on the south side of hoisting shaft, and also that shots had been fired in six rooms on the two west entries on north side of shaft, three of which were located on the back entry, and the other three on the front entry.

From the position in which we found cars, fragments of coal and a stopping between the two entries which had been partly blown out, I am of the opinion that one or more of the shots in the back entry were windy or "cyclone" shots, the fire from which exploded a keg of powder in a box near by, finding, as we did, fragments of this box scattered about. The explosion of the powder contained in this box, added to the flame from the windy shot, carried the fire to two or three boxes which were distant probably 200 to 250 feet and located in a small entry turned off near the north end of the mule stable; this, in turn, caused the explosion of the powder contained in five or six boxes located in a passage-way connecting the mule stable with the first east entry on south side of shaft. Doubtless the explosion of the powder in the last named boxes brought about the greatest damage and killed the mules. It would be well to state just here, that this mine is very dry and dusty, and I have no doubt that the coal dust suspended in the air which had been set in motion by previous shots, played quite an important part in the disaster by adding fuel to the flames.

Amos Algier, the injured miner, stated to me that they had fired all the shots on the south side of shaft, and had lighted six or seven in the first west entry on north side, and were going up the main north entry when the explosion occurred. He said it was the third shot that caused the explosion. The caps of the firemen were picked up by me, one twelve, the other sixteen yards up the main entry from the corner of the first west entry.

The method of ventilating Mine No. 7 is by splitting the air into two currents at the bottom of the down-cast—one part carried up the main north entry and back through the air-course to the west entry, thence up and around through the workings, returning through the air-course to the up-cast. The current to the south passes down the main south entry from bottom, and up the east entry and around workings, returning to the main south entry through the back air-course, thence to the head of south entry, and back through the air-course to the west entry and around workings in west entry, thence passing through the air-course to the up-cast shaft.

I took five readings of the air meter, of one minute each, in the air-course near the bottom of the up-cast shaft, and found 23,160 cubic feet of air passing per minute; the fan was making about 110 revolutions per minute at the time of the measurement. The evidence taken before the coroner's jury goes to show that the mine was in good condition prior to the explosion, and that there was no explosive gas in the mine. The fact that all the miners worked with open light is evidence to show that gas was not the prime cause of the disaster. However, in the heads of some of the rooms and entries, the faint singing sound of escaping gas under pressure could be heard. I made a careful examination of many cavities and high places where it would most likely be found, but in no case did I find it in sufficient quantities to detect with a safety lamp.

As a precaution, the company employed a fire boss to examine each working place every morning before any one was permitted to enter the mine. Pat Harding, mine boss, stated under oath before the coroner's jury: "I think the mine in good condition in every respect; we have plenty of air. There was no gas in the mine. I allow no man to go down without a box." Lewis Brown, a miner, testified as follows: "I sunk the shaft and have been working in it since it was started. There was no gas in the mine."

There seems to be a great waste of powder in getting the coal in mine No. 7, as shown by the following figures taken from the books of the company. During the month of September, 536 kegs of powder were used in producing 6,790 tons of

coal. This is only little more than 12.66 tons of coal for each keg used. More powder was probably used in this month, in proportion to the number of tons of coal mined, than usual, owing to the extra narrow work done turning rooms, driving entries, air-courses, etc.

It is the rule of the company to require each miner to have a box in which to keep his powder, and according to the sworn statement of Pat Harding, the mining boss, this order was enforced. In some cases I found that powder boxes had been left by some careless miners within 40 or 50 feet of the shots which had been fired. This practice should be prohibited by all means, as it is a well-known fact that it is no uncommon occurrence in the mines around Rich Hill, to have a windy or "cyclone" shot throw fire to the distance of 50 or more feet, and men have been burned by flames from blown-out shots 200 feet away. I believe that miners should not be allowed to take more powder in the mine than is absolutely required for present use. The law in Kansas prohibits any miner from taking more than five pounds of powder into the mine at any one time, and this in a closed vessel. As far as I have been able to ascertain, this section of the law is complied with and seems to give general satisfaction. I would not suggest that the miners of our State be restricted to five pounds for each miner, but think if they were not permitted to take more than 10 or 12 pounds in the mine at any one time, it would probably prevent a repetition of this accident.

I would further recommend that a sufficient interval between the firing of each shot be given to allow the dust raised by the previous shot to subside or be carried away by the ventilating current.

Respectfully,

C. C. Woodson, State Mine Inspector.

I received a letter from Mr. G. R. Sweeney, superintendent Keith & Perry Coal Co., under date of October 21, stating that, since starting up the mine after the explosion, he had ordered all powder kegs out of the mine, and had furnished each miner with a tin can in which to carry his powder. Each of these cans hold about 12½ pounds, is covered with a close-fitting cap, and is filled at the powder magazine before taking into the mine by a man employed for that purpose.

STATE MINE INSPECTOR.

LIST OF COAL MINE OPERATORS (BY COUNTIES)

That were operating mines during past year, with location and postoffice address.

Name of mine operator or company.	Postoffice.	Mine located near
ADAIR.		
Besanko's mine.....	Kirksville	Stahl.....
Harriott Bros.....	Stahl.....	Stahl.....
Ledford, John.....	"	"
Novinger, J. B.....	"	"
Pennsylvania Coal Co.....	Kirksville.....	Stahl and Danforth..
Scott, D. C.....	"	Kirksville.....
AUDRAIN.		
Andrain Mfg. & Coal Mining Co....	Vandalia.....	*Vandalia.....
Day, Geo. W.....	Laddonia	Laddonia
Detienne, Omer.....	Mt. Carmel	Mt. Carmel
Eastham, C. P.....	Laddonia.....	Laddonia
Howartt, John	Mt. Carmel	Mt. Carmel
Lynch, Owen.....	Laddonia.....	Laddonia
Montagne, James D.....	"	"
Oldham, Henry.....	Centralla	Centralla.....
Robbins & Mathews.....	Worcester.....	Worcester
Vandalia Coal Co.....	Vandalia.....	*Vandalia.....
Wiley, Frank.....	Centralla	Centralla
BARTON.		
Bacon, W. S.....	Lamar	Lamar
Beeker, Henry.....	"	"
Blacher, W. C.....	Esrom	Esrom
Boulware, P. G. & Co.....	Liberal	Liberal
Bristow & Kimball.....	Lamar	Lamar
Cameron, C. J.....	Liberal.....	Liberal.....
Carroll, A.....	"	"
Clark, Wilson.....	Lamar	Lamar
Cole, M.....	"	"
Cox, Thomas.....	Liberal.....	Liberal.....
Davery Bros.....	"	"
Dixon, J. W.....	Milford	Milford
Ferguson, J. C.....	Nashville	Nashville
Fouik, Phillip.....	Liberal	Liberal.....
Gilmore, James W.....	Sheldon	Sheldon
Gregory, Thos. & Sons.....	Lamar	Lamar
Hatfield, H. C.....	Liberal	*Liberal
Hays, Basil D.....	Lamar	Lamar
Jones, Wm.....	Verdella	Verdella
Lavery Bros.....	Liberal	Liberal
Laws, John.....	Beloit.....	Beloit.....
Liberal Coal Co.....	Liberal	*Liberal
Lucas, M. H.....	Pedro	Pedro
Mack, W. L.....	Lamar	Lamar
Morgan, C. H.....	Minden Mine	*Minden
Owens' Bank.....	Lamar	Lamar
Parry, J. C.....	"	"
Perkins, John	Liberal	Liberal
Perry, W. H.....	Milford	Milford
Rowes, L. J.....	Sheldon (Vernon Co)...	Sheldon
Ryan, G. G.....	Milford	Milford
Spear, M. M.....	Lamar	Lamar
Spring, Mattie B.....	"	"

*Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
Stukey, Ephraim	Beloit.....	Beloit.....
Sturdevant, J. O.	Lamar.....	Lamar.....
The Wear Coal Co.	Minden Mine.....	*Minden.....
Waite, C. G.	Pittsburg.....	Minden.....
Whitsell, H. J.	Liberal.....	Liberal.....
Wilson, John G.	".....	".....
BATES.		
Baldwin, L.	Worland.....	Worland.....
Bruce, W.	Rich Hill.....	*Shobe.....
Caton, F. H.	Worland.....	Worland.....
Farrar & Armstrong.	Hume.....	Hume.....
Funk, Benjamin	".....	Foster.....
Hines Bros.	Rich Hill.....	Rich Hill.....
Hooker Bros.	Amoret.....	Amoret.....
Hopkins, S. W.	Rich Hill.....	Rich Hill.....
Hunt Bros.	Worland.....	Worland.....
Jenkins' Bank	Shobe.....	".....
Johnson, John.....	Worland.....	Worland.....
Keith & Perry Coal Co.	Kansas City.....	*Rich Hill.....
Mace, W. H.	Foster.....	Foster.....
Martin, M. K.	Rich Hill.....	Rich Hill.....
Missouri Coal & Construction Co.	Kansas City.....	*Amoret.....
Lucas, W. W.	Rich Hill.....	*Rich Hill.....
Pearson, Peter.....	".....	".....
Rich Hill Coal & Mining Co. No. 2.	".....	*.....
Wethers, No. 3.....	".....	*.....
Graham, Thos., No. 4.	".....	*.....
Barton & Cheney.	".....	*.....
Simeon, Jay.....	".....	*.....
Martin, F. M.	".....	*.....
Raney, F. A.	Worland.....	Worland.....
Robinson, D. L.	".....	".....
Seawell, J. M. & Co.	Kansas City.....	Rich Hill.....
Skillman, A.	Foster.....	Foster.....
Springer & Gardner.....	Worland.....	*Worland.....
Sullivan & Cheney.....	Rich Hill.....	*Rich Hill.....
Spencer, O.	".....	".....
Thurman, E. H.	".....	".....
Vance, J. A.	Amoret.....	Amoret.....
Western Coal and Mining Co. No. 1.	Foster.....	*Foster.....
Williams, Frank & Co.	Rich Hill.....	Rich Hill.....
Wise, J. M.	".....	*.....
Woodson & Woodson.....	".....	*.....
BOONE.		
Benefield, E. B.	Columbia.....	*Columbia.....
Columbia Coal Co.	".....	*.....
Davis, Isaac.....	Brown's Station.....	Brown's Station.....
Gaither, James W.	".....	".....
Goodding, W. A. & Co.	Columbia.....	*Columbia.....
Gordon, T. S.	".....	".....
Gossett & Bro.	".....	".....
Jones, Walter.....	Brown's Station.....	".....
Kurtz, D. W. B.	Columbia.....	".....
Lowery, Geo.	".....	".....
Mayer, D. A. & Bros.....	Sturgeon.....	Sturgeon.....
Peters, M. C.	Columbia.....	Columbia.....
Quittier, L.	".....	".....
Redifer & Edwards.....	Centralia.....	*Centralia.....

*Employing 10 or more men

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
Short, J. B.	Harrisburg	Harrisburg.....
Stidhame, W. A.	"	"
Stone, James W.	Perche	Perche
Wiley, Frank	Centralia	Centralia.....
Winterholter.....	Brown's Station	Brown's Station
Blakemore, Thos. H.	Harrisburg	"
CALDWELL.		
Caldwell Coal Co	Hamilton	*Hamilton
Hamilton Coal Co	"	* "
CALLAWAY.		
Bishop, R. L. & Co	Fulton	Fulton
Castle, Wm.	"	"
Harris, A. & Bros.	"	* "
Harris, John	"	"
Henderson, J. S.	McCredie	"
Holmes, Adolphus	Fulton	* "
Griswold, Warner	Guthrie	Guthrie
Lamers, R.	Fulton	Fulton
Guy, Wm.	Stephens' Store	Stephens' Store
Maycock, Samuel	Fulton	Fulton
Oldham, Wm	Stephens' Store	Stephens' Store
Smith, James	Fulton	*Fulton
CEDAR.		
Anderson, W. O	Jerico	Jerico
Cole, M. M.	"	"
Daniels, Lee	"	"
Davis, A. B.	"	"
CHARITON.		
Clark, Matthew	Marceline, Linn Co.	*Marceline
Price, E. W.	Keytesville	Keytesville
Stanton Bros.	Marceline	"
CLAY.		
Randolph Coal and Gas Co.	Kansas City	*Randolph.....
COLE.		
Elston, F. M. & Co.	Elston	*Elston
COOPER.		
Missouri Valley Coal & Mining Co..	Boonville.....	*Boonville.....
Palmberg, A.	Bunceton	Bunceton
DADE.		
Leonard, A.	Sylvania	Sylvania.....
McCluey, Robt.	"	* "
Riley, Jack	"	"
Sharp, R. M.	"	"
Shoemaker, J. K.	Cedarville	Cedarville
Zook, Eli	Sylvania	Sylvania.....

*Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
GRUNDY.		
Grundy County Coal Co	Trenton	*Trenton
HENRY.		
Baldwin & Fonda	Calhoun	*Calhoun
Bode, H. H.	Clinton	*Clinton
Cohen, S. B.	Sedalia	* "
Co-operative Coal Co	Lewis Station	*Lewis Station
Dunlap Coal Co.	Brownington	*Brownington
Hobbs, H. B.	Deepwater	*Deepwater
Hurst, John	"	* "
Hurst, J. W.	"	* "
Kay Coal Co.	"	* "
Keith & Perry Coal Co.	Kansas City	* "
McFadden & Evans.	Deepwater	* "
Noble, H. T.	North	*North
Pigg, D. B. C. & M. Co.	Lewis Station	*Lewis Station
Owens, B. L.	Clinton	*Clinton
Tebo Coal Co.	Lewis Station	*Lewis Station
Thompson, John & Co.	Brownington	*Brownington
Woods & North Coal Co.	North	*North
JASPER.		
Williams, A. W.	Joplin	Joplin
JOHNSON.		
Boyd, Thos. H. & Co	Knob Noster	*Knob Noster
Bullock, D. A.	Warrensburg	Montserratt
Doffelmeyer, T. T.	"	Warrensburg
Evans, Jno. B.	"	"
House, John	Knob Noster	Montserratt
Macrae, A. W.	Warrensburg	Warrensburg
Melley, M. B.	"	"
Murley, Fitch & Harden.	Montserratt	Montserratt
Murley, Joseph.	"	"
Park, John	Dunksburg	Dunksburg
Phillips, Wm	Warrensburg	Warrensburg
Serany, J. S.	Dunksburg	Dunksburg
Strickland, G. W.	"	"
Warrensburg Electric Light Co	Warrensburg	Warrensburg
Wood, B. F.	"	"
LAFAYETTE.		
Bell & Greer	Lexington	*Lexington
Bolen Coal Co.	Kansas City	*Higginsville
Bonanza Coal Co.	Higginsville	* "
Bruce, J. D.	Kansas City	* "
Carter, Andrew	Wellington	Wellington
Clark, Thomas	Lexington	Lexington
Corder Coal & Coke Co.	Corder	*Corder
Dover Coal Co.	Dover	*Lexington
Elling's Mine	Concordia	Concordia
Excelsior Coal & Coke Co.	Higginsville	*Higginsville
Fitzgerald, S. J.	Aullville	Aullville
Gasaway, L. A.	Mayview	*Mayview
Gunn & Co.	Higginsville	*Higginsville
Graham, R.	Aullville	*Aullville

*Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
Haygood Coal Co.....	Higginsville.....	*Higginsville.....
Hartman, C. H.....	Kansas City.....	*Waterloo.....
Hoffman, Emil.....	Higginsville.....	Higginsville.....
Kelley Coal Co.....	Lexington.....	Lexington.....
Kist, Joseph.....	".....	".....
Krampt, Robt.....	Concordia.....	Concordia.....
Kresse, A. F.....	".....	".....
Lafayette Coal Co.....	Lexington.....	*Lexington.....
Lexington Coal & Min. Co.....	".....	*".....
McCarty, C. F.....	Corder.....	Corder.....
McGrew, J. C.....	Lexington.....	*Lexington.....
Macey, Henry.....	Kansas City.....	*".....
Missouri River Coal Co.....	Lexington.....	*Napoleon.....
Morrison Bros.....	".....	Lexington.....
O'Malley, Andrew.....	".....	".....
Napoleon Coal & Min. Co.....	Napoleon.....	*Napoleon.....
Republican Mine.....	Higginsville.....	*Higginsville.....
Tate, Jno. W.....	".....	".....
Seawell, J. M. & Co.....	Kansas City.....	*Wellington.....
Stealy & Fowler Coal Co.....	Higginsville.....	*Higginsville.....
Walton, Thos.....	Lexington.....	*Lexington.....
Wellington Coal Co.....	Wellington.....	*Wellington.....
Wilkes, S. E.....	Higginsville.....	Higginsville.....
Winsor Coal Co.....	Lexington.....	*Higginsville.....
Rocky Branch Coal Co.....	Higginsville.....	*".....
Powell, E. B.....	".....	".....
LINN.		
Clark Coal Co.....	Brookfield.....	*Brookfield.....
Hause, Peabody & Co.....	".....	*".....
Kansas & Texas Coal Co.....	St. Louis.....	*Marceline.....
Schaeffer, Bernard.....	Brookfield.....	Brookfield.....
LIVINGSTON.		
Cox, W. A.....	Chillicothe.....	Chillicothe.....
MACON.		
Bachelder, George.....	Macon.....	Macon City.....
Bevier Black Diamond Co.....	Bevier.....	*Bevier.....
Kansas & Texas Coal Co.....	St. Louis.....	*Ardmore and Bevier.....
Little Pittsburg.....	Lingo.....	*Lingo.....
Loomis & Snively Coal Co.....	Bevier.....	*Bevier.....
Oakdale Coal Co.....	St. Joseph.....	*".....
The Macon Coal Co.....	Macon.....	*Macon.....
Watson Coal & M. Co.....	Bevier.....	*Bevier.....
MILLER.		
Rusk, Louis.....	Eldon.....	Eldon.....
MONITEAU.		
Kansas & Missouri Improvement Co.....	Topeka, Kas.....	.....
MONROE.		
Hughes, Lad.....	Victor.....	Victor.....

*Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
MONTGOMERY.		
Vandalla Coal Co.....	Wellsville.....	*Wellsville
Whitehead, Henry	"	"
MORGAN.		
Stover Coal Mines.....	Versailles	Versailles.....
NODAWAY.		
Carlew & Co.....	Quitman.....	Quitman.....
Dixon	"	"
Harris, Reuben.....	"	"
Holt, Wm.....	"	"
Kessinger, Wm.....	"	"
Nelson, G. W.....	"	"
Nichols, Joseph.....	"	"
Pearson, Samuel.....	"	"
Pierson & Co.....	"	"
Roberts, N.....	"	"
Tarpley, Benjamin	"	"
PUTNAM.		
Blackbird Coal Co.....	Unionville	*Unionville.....
De Garmo, G. E.....	"	"
Gorman, Pat.....	Dean, Ia.....	Dean.....
Lane & Love.....	Unionville.....	Unionville.....
Mendota C. & M. Co.....	Mendota.....	*Mendota.....
Pherigo, Martin.....	Unionville.....	Unionville.....
RALLS.		
Boulware, E. L.	Perry.....	Perry.....
Evans, J. S.	"	"
Russell, John	"	"
RANDOLPH.		
Burk, J. S.....	Huntsville.....	Huntsville.....
Cooley, J. M.....	Cairo	Cairo
Edwards, Sr., Emanuel.....	Huntsville.....	Huntsville.....
Elmore, T. M.....	"	*
Enterprise Coal Co.....	Renick	*Renick
Ferguson, Allen.....	Huntsville.....	Huntsville.....
Higbee Coal & Mining Co.....	Higbee	*Higbee
Interstate Mining Co.....	"	*
Jones, Geo. W.....	Huntsville.....	Huntsville.....
Lowes, John.....	"	"
Milburn & Sons, Joseph	Thomas Hill.....	Thomas Hill.....
Mitchell, W. E. & Co.....	Huntsville.....	Huntsville.....
Osage Coal & Mining Co.....	St. Louis	Elliott
Palson, John F.....	Cairo	Cairo
Randolph County Coal Co.....	Huntsville.....	*Huntsville.....
Williams, J. B.....	Moberly.....	Moberly.....
Rutherford & Son, H. L.....	Huntsville.....	*Huntsville.....

* Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
RAY.		
Black Diamond.....	Richmond	*Richmond
Bovard-Brown Coal Co	Camden	*Camden.....
Buchlinger, Fred	Hardin	Hardin
Slater & Co.....	Georgeville	Georgeville
Craven Coal Co.....	Camden	*Camden
Darneal Coal Co	Richmond	*Richmond
Dickson, H. A.....	Hardin	Hardin
Douglas & Moore.....	Richmond	*Richmond
Hartwell, Arnold & Co	Norborne (Carroll Co) ..	*Hardin
Hubbell Mining Co	Richmond	*Richmond
Hubbell, Hyatt & Hubbell.....	"	*
Huston, Joseph.....	Hardin	*Hardin
Kansas & Texas Coal Co	St. Louis	Fleming
Kellenberger's Mine.....	Hardin	Hardin.....
McCorkendale, John.....	Norborne (Carroll Co) ..	"
Osborn, Robert.....	Hardin	"
Phillips, Wm	Norborne (Carroll Co) ..	"
Pickering, Joseph, Coal Co	Richmond	*Richmond
Richmond Coal Co.....	"	Richmond & Camden.
Scrivens, Wm	Norborne (Carroll Co) ..	Hardin.....
Sickels, Wm	"	"
Williams, R. J., Coal Co	Swanwick	*Swanwick
Hankin, W. D. & C	Lexington	*Richmond
SALINE.		
Alexander, Frank	Arrow Rock	Arrow Rock
Auer, J. F.....	Slater	Slater
Beard, W. N.....	"	*
Briggs, Isaac	"	"
Hedgers, Wm. T.....	"	"
Hodgkiss, Ed	Mount Leonard	Mt. Leonard
Hunter, Barney	Slater	Slater
Marmaduke, H. H.....	Sweet Springs	Sweet Springs
Pittman, Esther	Cretcher	Cretcher
Tennill, Jno. W.....	Slater	Slater
Thompson, R. P	"	"
VanBuskirk, A	Cretcher	Cretcher
Wilburn Coal Co.....	Marshall	Napton
SCHUYLER.		
James, W. F.....	Coatesville.....	Coatesville.....
Mock, T. J. & Sons.....	"	"
SULLIVAN.		
Milan Land and Coal and Mining Co.	Milan.....	Milan.....
ST. CLAIR.		
Bidler, F. M.....	Osceola	Osceola
Chinn, John	Lowry City.....	Lowry City
Johnson, J. M.....	Taberville	Taberville
Owen Coal Co.....	Vista	Vista
Vannice, G. A	"	"
Watkins, Wm	Osceola	Osceola
Wilson, R. B.....	Taberville	Taberville.....

*Employing 10 or more men.

LIST OF COAL MINE OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
SHELBY.		
Yost, W. T.....	Pansy	Pansy
VERNON.		
Allen, R. E.....	Rich Hill (Bates Co.)..	Carbon Centre.....
Brown, John & Bros.....	Moundville.....	Moundville
Burks, C. M.....	Walker	Walker
Burton, W. C.....	Bronaugh	Bronaugh
Crawford, C. B.....	Walker	Walker
Davis, Joseph.....	"	"
Devere, J. M.....	Moundville	*Moundville
Dickson Mine.....	Nevada	Nevada
Downing, E. S.....	Walker.....	Walker
Every, Milton	"	"
Ferry, B. C. & W. T.....	Milo.....	Milo
Finley, L.....	Nevada	"
Franks, A. H.....	Moundville.....	Moundville.....
Gill, J. F.....	"	"
Green, Edward.....	Bellamy.....	Bellamy
Gonterman, W. G.....	Sheldon	Sheldon
Hightower, J. H.....	Walker.....	Walker
Hill, Willis D.....	Moundville.....	*Moundville
Hoss, G. S.....	Nevada	Carbon Centre.....
Hunter, E. N.....	Walker	Walker
Johnsons.....	"	"
Larkin, W. E.....	Bronaugh.....	Bronaugh.....
Linn & Co.....	Nevada	"
Lucas, J. C.....	Bronaugh.....	Bronaugh.....
Moore, John	Moundville.....	Moundville
O'Bryan, Wm. & Co.....	Carbon Centre.....	*Carbon Centre.....
Potter, Sam'l.....	Walker	Walker
Powell, W. S. Coal Co.....	Moundville.....	Moundville.....
Prewitt, W. H.....	Walker	Walker
Robinson, W. D.....	Moundville	Moundville
Salsman, J. B.....	Carbon Centre.....	*Carbon Centre.....
Smith, Peter	Bronaugh	Bronaugh
Yadon, T. A.....	Walker	Walker
Wright, J. D.....	"	"
Seawell & Co., J. M.....	Kansas City.....	*Carbon Centre.....
Pope, S. O.....	Carbon Centre	"

* Employing 10 or more men.

RULES AND REGULATIONS OF THE KANSAS AND TEXAS COAL COMPANY,

FOR THE OPERATION OF MINES AND SAFETY OF EMPLOYEES.

1. Miners, or other workmen engaged at the mines, shall read, and such as cannot read shall have these rules read to them; and all persons engaging in the service of the Company must be governed by these rules and regulations.

2. Every employe of the Company will be required to be ready for duty when the whistle blows for work every morning, and will be expected to perform a full day's work of ten (10) hours, in his respective line of employment, unless the foreman of his department orders less time to be worked. Engineers are strictly forbidden to lower any miner, or underground laborer, into any pit after seven (7) o'clock a. m., without orders from the superintendent or pit boss.

3. No suspension of work shall take place during working hours, except in case of actual necessity, and no meeting of any character shall be held in the pit.

4. Any employe feeling aggrieved in any respect must present his complaint to the pit boss in person; if he fails to adjust the matter in a manner satisfactory to the employe, it may be referred to the superintendent, whose decision, upon the hearing of both sides of the question, shall be final.

5. No person, miner or other workman, where a stairway or other passage is provided, in mines not over sixty (60) feet in perpendicular depth from the surface of the ground, shall be lowered or hoisted with the cage or car, into or out of the mine.

6. As each shaft is provided with a passway around the shaft at the bottom, all persons employed in the mines, or others, are strictly forbidden to cross over from one side of the shaft to the other, either on the cage when resting on the bottom or under it when ascending or descending in the shaft, and it shall be the duty of the pit boss to see that all passways from one side of the shaft to the other are kept clear of obstructions.

7. Miners and other workmen employed in the mines, having any knowledge of noxious gases or bad air generated from the explosion of powder, insufficient ventilation, or other causes, which will render his place or the mine unsafe to work in, will notify the pit boss at once; and under no circumstances must he enter his room or place until it is cleared of such foul air or gases.

8. To avoid accidents from mines being in an unhealthy condition, no miner or other workmen will be permitted to enter, or remain in, the mine at night after working hours, for any purpose whatever, without first obtaining permission of the pit boss.

9. All persons employed in the mines knowing of any failure on the part of the pit boss to properly ventilate the mines, or in any way to neglect to take every precaution for the safety of the company's employes, must report the same at once to the superintendent, or in his absence, to the office of the company.

10. Miners are strictly forbidden, when firing a shot, to go into the next room for safety, but are required to go to a safe distance on the entry, in order to be out of all danger arising from the explosion of the shot.

11. Miners are strictly forbidden to fire a shot, without first giving warning of their intention to other workmen in the immediate neighborhood, and must wait until all are at a safe distance.

12. All coal must be mined and cut on the rib before shooting down the same; no shots allowed on the solid.

13. In mines not generating fire-damp, or other dangerous gases, the time for firing shots shall be at twelve (12) o'clock noon and half-past five (5:30) o'clock in the evening, and in no case will an employe be permitted to fire a shot later than fifteen (15) minutes past twelve (12) o'clock noon, thus avoiding the danger of workmen, on their return to work after dinner being overcome by noxious gases arising from the explosion of powder from said shots. This section does not apply to mines where shot firers are used or where it is a rule to only fire once per day.

14. It shall be the duty of every miner working in the mines to keep his room in the mine well propped, in good order and repair, to keep them perfectly safe in every way, and any miner who shall willfully, negligently, or carelessly suffer his room to get out of order and repair, and who shall not, upon request, immediately put same in repair, the company may put such room in repair at the expense of the miner in default, and may retain the amount of such expense from the next or any future payment to which said employe would be otherwise entitled, until fully reimbursed for such expense.

15. In working places where the roof is dangerous and sufficient timber cannot be procured, it shall be the duty of the workman or miner to notify the pit boss at once and stop work until timber can be obtained. All timber and rails will be furnished each working place at the point of delivery of empty cars to be loaded by the miner after the same have been ordered by him.

16. No miner who has left the employ of the company, whether voluntarily or by discharge, will be entitled to receive any arrearage of pay due him for labor performed, whether on the regular pay-day or during the interval preceeding pay-day, until he shall have put his room in perfect working order, as required by the company. All miners leaving said employment will be required to procure the certificate of the pit boss that they have complied with the requirements of the rule as aforesaid, before making application at the company's office for final payment.

17. If any miner or other workman should leave an empty pit-car in his room over night and the car should be lost or destroyed by the caving in of the room, or the firing of a shot, the full value of said pit-car will be charged to him.

18. The engineer, or person for the time being having charge of the engine and boiler, must keep a sufficient depth of water in his boiler under all circumstances, and in case he fails to do so, he must immediately dampen the fires and report the exact situation to the person in charge over him. In no instance shall a fire be started under the boiler until the person employed for that purpose shall have first ascertained that the boiler contains an ample supply of water.

19. All loitering, loafing or idling in the engine-room or on the pit-top, is strictly forbidden, and no one will be allowed in the engine-room except those having charge of the same.

20. Every employe in the mine, except those whose duty it is to attend to that part of the work, is strictly forbidden to meddle in any way with the signal bells at any time; and in no case must anyone, except the cager, who is in charge at the bottom of the shaft, ring off the cage.

21. It shall be the duty of the top man to examine daily the ropes, chains, cages and all attachments to the ropes and cages on shafts or slopes, to see that they are secure, and in case that any defect is discovered, to report to the superintendent or other person in charge at that time, and if the defect be of such nature as to jeopardize the lives of the workmen in and about the shaft or slope, he shall notify the engineer, who shall use all precaution until such defects are repaired.

22. All drivers having charge of mules and the hauling of the coal from the miners, must be in the mines and have their mules fed, cleaned and harnessed, and be ready for work not later than fifteen minutes before 7 o'clock a. m.; and any driver known to have abused or mistreated his mules shall be discharged at once.

23. Any miner or other workman taking tools or powder not belonging to him shall be discharged from the service of the company.

24. In mines where gas, commonly known as fire-damp, is generated, all miners or other underground workmen are strictly prohibited from entering their working place or roadway at starting time in the morning, until they have been notified by the fire-boss, or person acting in that capacity, that there is no standing gas therein and that it is safe for them to enter the same. The fire-boss, or person acting in that capacity, shall examine every working place in the morning for standing gas before any miner or other underground employe shall enter the same and he shall mark the day of the month at some conspicuous point in each working place with chalk, which will be evidence that he has made the examination. After he has made the examination he shall ring an agreed number of bells to the engineer, which will signify that it is safe, or not safe, as the case may be, to lower the underground employes into the mine. The mine being reported to the engineer as safe to enter, the fire-boss shall station himself at the entrance of the mine, and shall notify and acquaint the workmen with the condition of their working places. If he should find any dangerous quantities of gas in any working place, he shall notify the parties expecting to work therein not to enter, and he shall also notify the pit-boss or superintendent as to the result of his examination, and they will assist him in removing the same in a careful manner, and avoid accidents to workmen in other portions of the mine.

25. Any miner, workman or other person who shall intentionally injure any safety-lamp, instrument, air-way, brattice, or obstruct or throw open air-ways, or carry lighted lamps, pipes or matches into places worked by the light of safety-lamps, or shall move or disturb any part of the machinery, or open a door and not close it again, or enter any place of the mine against caution, or disobey any order given in carrying out the provisions of this act, or shall intimidate, hinder, prevent or attempt to intimidate, hinder or prevent any person from performing any labor in or about said mine or mines by consent of owner or operator, or who shall do any willful act whereby the lives or health of persons or the security of the mine or the machinery is endangered, shall be deemed guilty of a misdemeanor and be discharged at once.

Signed,

J. R. BRAIDWOOD,
Superintendent.

GLOSSARY

OF MINING TERMS USED IN MISSOURI.

After-damp—The mixture of gases remaining in a mine after an explosion of fire-damp.

Air—The current of atmospheric air circulating through and ventilating the workings of a mine.

Air-shaft—A shaft used expressly for ventilation.

Air-stack—A ventilating chimney.

Air-way—Any passage in a mine through which air for ventilating purposes is passed.

Anemometer—An instrument used for measuring the velocity of a ventilating current.

Bearing in—Undermining.

Black damp—Carbonic acid gas= CO_2 . It will not support combustion or life.

Blower—A strong discharge of gas from a fissure.

Blown-out shot—A shot that has blown out the tamping without bringing down the coal.

Bonnet—A shield or covering over a cage to protect it and the miners from anything falling down the shaft.

Bottom—The landing at the bottom of the shaft or slope; the floor, bottom rock, or stratum underlying a coal seam.

Brattice—A division or partition in a shaft, slope, heading, gangway or other underground working places for providing ventilation.

Brattice-cloth—A heavy cloth or canvas, often covered with some water-proofing material, used in the construction of doors and brattices instead of plank.

Bridle chains—Short chains by which the rope is attached to the cage.

Buntons—Timbers placed horizontally across a shaft to carry the cage guides, also to strengthen the shaft timbers.

Butty—A partner in a contract for driving or mining; comrade, crony.

Cage—A platform on which the mine cars are raised and lowered in mine.

Car-mine car—Any car used for the conveyance of coal or mineral in a mine.

Cap—A piece of plank used on the top of a prop.

Cartridge—Paper or water-proof cylindrical cases filled with gun-powder, forming the charge for blasting.

Catches, latches or keeps—Catches or rests, to hold the cage when it is brought to rest at the top, bottom or any intermediate landing; also, stops fitted on a cage to prevent cars from running off.

Cave-in—A caving-in of the surface over mine workings= CH_4 . The chemical symbol for fire-damp.

Charge—The amount of powder or other explosive used in one blast or shot.

Choke-damp—(See black damp).

Chute (also spelled **Shute**)—Any passage through which the coal descends by gravity.

Clanney lamp—A safety-lamp invented by Dr. Clanney.

Clood—A layer of soft shale or slate, forming a very bad roof over a seam of coal.

Coal measures—The carboniferous formation.

Colliery—The whole plant, including the mine and all adjuncts.

Colum pipe—The pipe through which the water is conveyed from the mine pumps to the surface.

Creep, or squeeze—The gradual upheaval of the floor of a mine, due to the weight of the overlying strata.

Crib—A structure composed of horizontal frames of timber laid upon one another, or a frame-work built like a log cabin.

Cribbing—Timbering a shaft with crib-work, commonly extending from surface to the bottom.

Cropping out—Coming to the surface; out-cropping.

Cross-cut—A small passage-way driven at right angles to the main heading or entry to connect it with a parallel gangway or air-course.

Crusher—A machine used at lead and zinc mines to crush rocks containing disseminated ores.

Concentrating works—A complete plant for cleaning ores, consisting of crushers, rolls and jigs.

Davy lamp—A safety-lamp invented by Sir Humphrey Davy.

Dead-work—Work, which at the time it is done and of itself, produces little or no profit.

Digging—Mining operations in coal or other mines.

Dip—To slope downward from the surface. The inclination of a stratum or a coal seam.

Ditch—The drainage gutter.

Doors—Wooden doors fixed in underground roads to prevent the ventilating current from taking a short cut to the up-cast air-way.

Down-cast—The opening through which the fresh air is drawn or forced into the mine—the in-take.

Drift—A water-level gang-way or entry driven into the seam from the surface.

Drum—The revolving cylinder around which the winding rope is coiled.

Dump—1. A pile or heap of ore, coal, slate or rock. (2.) The tippie by which the cars are dumped. (3.) To unload a car by tipping it up.

Entry—Main haulage roads or gang-way.

Face, or working-face—The place at which the coal is actually being worked away, either in a breast or heading.

Fall—1. A mass of roof or side which has fallen in any part of a mine. (2.) To blast or wedge down coal.

Fan—Centrifugal mechanical ventilator.

Fault—A fracture or disturbance of the stratum breaking the continuity of the seam.

Fire—A word shouted by miners to warn one another when a shot is fired.

Fire-boss—A man whose duty it is to examine the workings for accumulations of explosive gas, etc.

Fire-damp—The explosive gas of coal mines—light carburetted hydrogen; the chemical formula is C_2H_4 .

Furnace—A large coal fire at or near the bottom of an up-cast shaft for producing a current of air for ventilating the mine.

Gas—Fire-damp.

Goaf or gob—1. A space from which the coal has been worked away and the space more or less filled up. 2. The refuse or waste left in the mine.

Gob-fire—Spontaneous combustion underground.

Guides—Vertical timbers fastened to the buntoms to steady and guide the cage.

Head-gear—The pulley frame erected over a shaft.

Head-house—When the head-frame is housed in, the structure is known by this name.

Heading—A gang-way or entry.

Horse-back—Natural channels, cut or washed away by water, in a coal seam, and filled up with shale and sandstone. Sometimes a bank or ridge of foreign matter in a coal seam.

Incline—A slope, any inclined plane, whether above or below the surface.

Indicator—Any instrument or device for indicating the position of the cage in the shaft.

Intake—The passage through which the fresh air is drawn or forced in a mine.

Jig—A machine for separating ores or minerals from worthless rock by means of their difference in specific gravity; called also a "washer."

Keeps—See Catches.

Lagging—Small round timber, slabs or planks, driven in behind the legs and over the collar to prevent pieces of the roof from falling through.

Landing—The top or bottom of a slope, shaft or inclined plane.

Latches—A synonym of switch, applied to the split rail and hinged switches.

Long-wall—A system of working a seam of coal in which the whole of the seam is taken out, leaving no pillars, except sometimes a pillar to support the bottom of shaft.

Loader—One who fills the mine cars at the working place.

Manager—An official who has the daily control and supervision of a mine, both above and below ground.

Manway—A small passage used as a traveling way for the miner.

Motive column—The length of column of air in the downcast shaft which would be equal in weight to the difference in weight of the air in downcast and upcast shaft. The power obtained by furnace ventilation is measured by the difference of the weight of the air in the two shafts.

Mouth—The surface end of a shaft or drift.

Narrow work—Headings, air courses, gangways, entries, etc.

Natural ventilation—Ventilating a mine without either furnace or other artificial means.

Needle—A sharp-pointed metal rod, placed in a bore-hole during the tamping of the charge, to leave on its withdrawal an opening through which the charge can be fired.

Nut coal—Coal that passes through an inch or an inch and one-half screen, and over a half-inch screen.

Opening—Cave or loose ground miners in Southwest Missouri do not expect to strike ore until an opening is found.

Out-crop—That portion of a vein, bed or any stratum appearing at the surface or occurring immediately beneath the soil.

Out-put—The total product of a mine.

Over-cast—A passage through which the ventilating current is conveyed over an entry or air-course.

Parting—Any thin interstratified bed of earthy material.

Pillar—A solid block of coal left to support the roof.

Pillar and room—A system of working coal by which solid blocks of coal are left on either side of rooms, entries, etc., to support the roof until the rooms are driven up, after which they are drawn out.

Pitch—Dip or rise of a seam.

Plan—The system on which a mine is worked, as "long-wall," "pillar and room," etc.

Propping—The timbering of a mine.

Prospecting—Examining a tract of country in search of minerals.

Pulley—The wheel over which a winding rope passes at the top of the head-gear.

Regulator—A frame with a slide door to regulate the amount of air passing into any part of the workings.

Return air—Air that has passed through the workings.

Rib—The side of a pillar.

Roof—The rock lying above a coal bed or ore vein; the hanging wall.

Safety cage—A cage provided with an automatic safety catch.

Safety lamp—A miner's lamp, in which the flame is protected in such a manner that an explosive mixture of air and fire-damp can be detected by the mixture burning inside of the gauge. This warns the miner to extinguish his light, as the mixture is dangerous.

Safety catches—Appliances fitted to cages to make them *safety cages*.

Screen—(1) A mechanical apparatus for separating small from large coal. (2) A cloth brattice or curtain hung across a road in a mine to direct the ventilation.

Seam—(1) A bed of coal. (2) A fissure or joint, either empty or filled with foreign matter.

Shaft—A vertical pit or hole made through strata, through which the product of the mine is brought to the surface, and through which the ventilation is passed either into or out of the mine.

Sheave—A wheel with a grooved circumference, over which a rope is turned, either for the transmission of power or for winding or hauling.

Shot—(1) A blast. (2) The firing of a blast. (3) Injured by a blast.

Shot-lighter or shot-firer—A man specially appointed by the manager of the mine to fire off shots.

Sink—To excavate, to bore or put down a bore hole.

Siphon—A simple, very effective and economical mode of conveying water in a mine over a hill. It takes the form of an iron pipe, bent like an inverted U; the vertical height between the water and top of hill must not exceed 28 or 30 feet, and the discharge end must be lower than the suction end.

Slack—Small coal which will pass through a small screen.

Slip—(1) A fault. (2) A smooth joint or crack in seam.

Slope—The main engine plane or inclined roadway driven in the seam of coal; worked from the out-crop, up which the whole of the product of the mine is raised by the winding engine.

Sprag—(1) A short billet of wood used to lock the wheels of a mine-car in place of a brake.

(2) A short wooden prop, set in a slanting position for keeping up the coal while it is being undermined.

Squeeze—See Creep.

Steam coal—A hard, free-burning, non-caking coal.

Steam jet—A system of ventilating a mine by means of a number of jets of steam at high pressure kept constantly blowing off from a series of pipes in the bottom of the up-cast shaft.

Stopping—An air-tight wall, built across any passage-way in a mine.

Strip—To remove the overlying strata of a bed of mineral and take it out by open work.

Sump—A receptacle into which the drainage of a mine flows and from which it is pumped to the surface.

Sulphur—Iron pyrites.

Tamp—To fill up a bore hole above the charge with some strongly resistant substance, rammed hard upon the powder.

Timber—(1) Prop, bars, collars, laggings, etc. (2) To set or place timbers in a mine.

Tram-road—A mine track or railroad.

Trapper—A small boy employed underground to open and shut doors during the passage of trips.

Trouble—A dislocation or fault; any irregularity in the bed.

Up-cast—The shaft through which the return air ascends and is got rid of.

Vein—A seam of coal or other mineral.

Ventilation—The atmospheric air circulating in a mine.

Wast—See goaf.

Water gauge—An instrument for measuring the drag or friction of air in mine.

Water level—An entry or gangway driven very nearly level, for the purpose of draining.

White damp—Carbonic oxide, a gas occasionally found in coal mines, generally a product of combustion. Although it will support combustion, and under certain conditions it is inflammable, it quickly destroys life.

Workings—The openings of a colliery, including all roads, rooms, headings, entries, etc.

PART SECOND.

REPORT ON THE
LEAD AND ZINC INDUSTRY

FOR THE YEAR ENDING JUNE 30, 1891.

REPORT.

The aggregate value of the lead and zinc product during the past year was \$5,084,462.82, against \$4,355,519 for the year ending June 30, 1890. This shows an increase over the preceding year of about 16½ per cent. This amount of mineral was produced by 17 counties, with Jasper county leading in the production of zinc and St. Francois in lead.

The following table shows that the value of lead ore has increased from \$45.49 in 1890, to \$49.10 in 1891, while the zinc ore has decreased from \$22.51 per ton to \$21.60 during the same period.

There were 5,065 persons employed in and about the 610 shafts which were producing ore, and 1,450 men prospecting upon the lands. It must be understood that only those prospectors are reported who were employed on lands actually producing ore.

Doubtless there are as many more at work on adjoining lands.

There were 12 fatal accidents reported to this office as having occurred in and about the lead and zinc mines of the State, which shows one life lost for every 422 persons employed.

This compares very favorably with the report of 1890, which shows 13 lives to have been lost, or one for every 359 men employed. It also shows 3 less lives lost in 1891 than in 1890, although the value of the output during the past year was increased \$728,943 over preceding year.

TABLE VIII—Summary of general results of investigations in Lead and Zinc mines,

For year ending June 30, 1891, as compared with the year ending June 30, 1890.

	1890.	1891.	Increase over 1890.
Number counties in which mining was done..	13	17	4
Number mines in operation.....	535	610	75
Number tons of zinc ore mined.....	100,248.1	123,752	23,504
Number tons of lead ore mined.....	12,909.2	16,925.19	4,016
Number tons of pig lead.....	20,451.4	19,968.81	.....
Average value of zinc ore per ton at mines...	\$22 51	\$21 60	.....
Average value of lead ore per ton at mines....	45 49	49 10	\$3 61
Average value of pig lead per ton.....	73 91	79 13	5 22
Total value of zinc and lead ore and pig lead at mines	4,355,519 00	5,084,462 82	728,943
Total number of all employes.....	4,672	5,065	393
Total number of miners.....	2,236	2,397	161
Total number of other employes.....	2,436	2,668	232
Number of men killed... ..	13	12	.....
Number of wives made widows.....	8	5	.....
Number children made fatherless.	16	12	.....
Number non-fatal accidents.....	10	13	3
Number employes for each life lost.....	359	422	63
Number pumps in use.....	227	404	177
Number crushers in use.....	82	147	65
Number steam jigs in use.....	141	273	132

The following is a description of the condition and location of the lead and zinc mines of the State :

BARRY COUNTY.

Drake Mining company—W. H. Seamon, manager. Mine is located about $3\frac{1}{2}$ miles east of Purdy, and was formerly operated by G. H. Holford and known as the Henderson mine. Since the present company has taken charge, they have erected machinery for hoisting and crushing the ore. The ore was first found in the hill just above the bed of the creek and near the surface, permitting considerable mineral to be taken out by an open cut, but during the past year an entry or gangway has been driven in the hill on a level, through which the ore is being worked and delivered.

The work had been temporarily stopped in the entry at date of inspection (July, 1891), and was being confined to a heading which was being driven from the bottom of the shaft for the purpose of intersecting the upper level or entry in order to drain it. The principal ore produced is silicate of zinc, and some zinc blende is also found. (For table showing details, see page 156.)

Messrs. Kelly & Anderson—Mines located about $3\frac{1}{2}$ miles east of Purdy. The principal ore produced upon this land during the past year came out of the shaft operated by the Purdy Mining Co. The ore is found at a depth of about 35 feet; mine idle at date of inspection. (For details, see table, page 156.)

Lead and zinc ore have been struck on Shoal creek, in the western part of the county. At date of inspection (July 17) there were three companies employed sinking shafts to develop the properties. The Hinkley Mining Co. is opening mines on M. E. Northcutt's land located about $\frac{1}{2}$ mile south of Pioneer postoffice. Lead ore was found about the 15th of May, at a depth of 20 feet; seven miners are at work. About one mile above this mine a shaft has been sunk on John L. Mor-ton's land, which is said to have struck a fair prospect. Allen Stark & Co., of Peirce City, are opening mines on Shoal creek; they have 160 acres of land, 50 acres of which have been laid off in lots of one acre each, and nearly all these lots have been leased to sub-operators. Several shafts are being sunk, giving employment to 20 or 25 men. Mr. J. T. Stark is the superintendent. No ore has been shipped from these mines during the past year.

COLE COUNTY.

J. D. Woodworth & Co.—Own and operate an air-furnace for smelting lead ore, located about $1\frac{1}{2}$ miles east of Enon station. This furnace was erected several years ago, and has been in operation at intervals ever since. The principal ore produced in this and Moniteau counties during the past year has been smelted at this furnace. It is a good grade of ore and is found near the surface. Mining is done by farmers and farm laborers at odd times when not employed on the farm.

Following are the names, with the postoffice address of the parties producing the ore smelted at this furnace during the past year: George Dawson, Wm. Henderson, M. Farmer, Thos. Rodrick and Dooley & Co., at Decature; Wm. Glasscock & M. Campbell at Russellville; Joseph Street, Centretown, Cole county; and Samuel Metts, E. H. Crawford, High Point; H. H. Cook & Co., Frank Fielden, California, Moniteau county.

DADE COUNTY.

The value of the product has increased from \$17,296 in 1890 to \$17,846.70 in 1891. (For table showing character of mines, tonnage and value of output, see page 156.)

Allen and Hughes.—Mines located about 8 miles northwest of Greenfield; these mines are known as the "Pemberton mines." The ore was found near the surface, hence it was worked by open cut and by stripping, for several years; but at this date ore is being mined by sinking shafts. It is found in the clay, and therefore a great number of timbers are required to secure the overlying clay rock, boulders, etc. About 25 men are employed; E. R. Hughes is manager. (For details see table, page 156.)

Corry Mining Co.—Col. F. M. Shoemaker, manager; mine located about 10 miles northeast of Greenfield. A great deal of lead and zinc ore has been secured from these mines, but the principal ore was found from the surface to a depth of 35 feet. Since this company took charge one year ago, they have spent about \$12,000 prospecting and making improvements.

Both lead and silicate of zinc ore are found. Mines give employment to 25 or 30 men. (For table of details, see page 156.)

J. W. Thurman.—Mine was idle at date of inspection. They are located about 8 miles northeast of Greenfield, on McConnel & Ethridg's land. Ore produced was silicate of zinc. (For details see table, page 156.)

Southwest Mining company.—A. F. Nixon, sup't. This company have leases on several hundred acres of mineral land, lying from 6 to 8 miles northeast of Everton, upon which the mines are located. No men are employed by the company, but they are given permission to mine upon the land—the company paying them from \$6.00 to \$8.00 per ton for all ores obtained. The ore mined during the past year is a silicate of zinc, and is worth about \$10.00 per ton on railroad cars ready for shipment. (For table of details, see page 156.)

FRANKLIN COUNTY.

J. H. Bartle.—Owns and operates an air-furnace located at Saint Clair. All the lead ore mined in this county during the past year was smelted at this furnace, hence it was through the kindness of Mr. Bartle that I obtained the report of output, etc. Following names represent a few of the mines producing ore: Northumberland, Harmon, Covee, Read Hill and a number of others. No zinc ore is mined.

GREENE COUNTY.

While the lead product has shown a slight decrease during the past year as compared with the preceding year, the zinc output has increased from 552.9 tons in 1890 to 1071.1 tons in 1891.

The product of both minerals was valued at \$25,080 in the report of 1890, while the report for the past year shows the value of output to be \$30,425.65—an increase over 1890 of \$5,345.65. (For table showing output, value, etc., see page 157.)

ASH GROVE POSTOFFICE.

Duncan, J. K. P.—Mine located about 1½ mile south of Ash Grove. It was idle date of inspection (July) and had been for several weeks, having been in operation only a few months during the past year. (For details, see table, page 157.)

Dunlap & Co.—Mine located about 2 miles south of Ash Grove, on the McCord land. No mining was being done on the property date of inspection. They were sinking a prospect hole, which was down 130 feet, but had struck nothing of any value. (For details, see table, page 163.)

Goetz Mining company—J. H. Barton, superintendent; mines located about $1\frac{1}{2}$ mile southeast of Ash Grove.

The ore produced by this company is a high-grade galena, and is found near the surface, the deepest shaft not exceeding 30 feet. (For details, see pages 157 and 163.)

Murray & North—Mines located about $1\frac{1}{2}$ mile south of Ash Grove. At date of inspection (July) four mines were in operation producing ore, and a company prospecting with a drill. The ore now being worked is found from 50 to 75 feet below the surface, although a great deal of surface ore was worked several years ago. Both lead ore and silicate of zinc are found, the former worth about \$49 per ton, and the latter \$11 per ton. (For details, see table, page 163.)

Pennsylvania Mining company—E. A. Hurt, superintendent. This is a new company; it organized and commenced mining during the past year; mine located about $\frac{1}{2}$ mile south of Ash Grove. A prospect shaft is now being sunk, 6×8 feet in the clear, and well timbered. The only output so far has been lead ore. (For details, see table, page 157.)

Nixon & Holmes—Mine located near Brookline; ore is found near the surface, and is worked by individual operators.

MUMFORD POSTOFFICE.

J. A. Eaton & company—J. A. Eaton, of Springfield, manager. Mines located at Mumford, on the James river. They were put in operation during the past year, the first ore being hoisted in December, 1890. At this date four mines are producing ore, giving employment to about 18 hands. Lead and zinc are being mined, both of which command a good price in market; the average price of the lead is \$25 per thousand pounds, and \$22.50 per ton for zinc ore.

Inspection was made July, 1891. (For details, see table, page 163.)

Gumbo Mining company.—E. E. Ward, of Springfield, manager. Mine located on Pearson creek, and formerly known as the Pearson Creek mines. During the past year a shaft has been sunk, and the hoisting machinery removed to it from an old shaft. A custom crusher and rolls have been erected on the property, by Mr. Barber. Both lead and zinc ore are produced, but the latter in the greatest quantities. These ores command a good price in market; the average value of the lead ore for the past year at the mines was \$49.00 per ton, and \$22.50 per ton for zinc ore.

About 30 men were employed in and about the mines; date of inspection, July, 1891. (For details, see pages 157 and 163.)

James River Mining company.—Mine located at Mumford on the James river; Col. John E. Phelps, of Springfield, manager.

This company has control of about 240 acres of land upon which these mines are located.

But little actual mining has been done during the past year, but the company has had a great deal of prospecting going on with a Diamond drill.

No mines in operation date of inspection, July, 1891.

JASPER COUNTY.

This county has shown a wonderful increase in the mineral product during the past year, as compared with the preceding year.

The report of 1890 shows an output of 7,159.8 tons of lead and 74,141.4 tons of zinc, with a total value of \$2,152,602 for both lead and zinc, while this report for the year ending June 30, 1891, shows an output of 7,994 tons of lead, and 95,376 tons of zinc, valued at \$2,611,724.50 at the mines—thus showing an increase of 8,342.2 tons in the output of lead, and an increase in the zinc product of 21,234.6 tons, with an increased value of \$459,122.50. The average value of the lead ore has advanced from \$45.34 per ton in 1890 to \$49.10 in 1891, but the zinc ore has shown a decrease from \$24.65 to \$23.28 per ton during the same period.

By an examination of the statistical table on Jasper county, which will be found elsewhere, it will be seen that there were 386 shafts in the county actually producing ores during the months of July and August of this year. Statistics for this report were secured during the two months referred to.

These 386 shafts employ 253 boilers, 286 pumps, 108 crushers, 44 sets of rolls and 112 sets of steam jigs, located upon land controlled by 83 companies, together with concentrating plants, and furnish employment to 2,500 men; besides, there were 1,054 prospectors at work upon the properties.

Following remarks will partially explain the general character of each mining company's property, together with statement as to the improvements made at each during the past year. (For table showing character of mine, tonnage and value of output, see page 159.)

CARTHAGE POSTOFFICE.

Coshocton Mining Co.—Chas. Hubb, superintendent; mine located near the Mo. P. R. R. depot; steam-power; shaft 145 feet deep; mine idle date of inspection. (For table showing details, see page 164.)

Jasper County Mining Co.—F. R. Harris, superintendent; mine located on the right of way of the Mo. P. R. R. and near the Carthage depot; mine had been idle for some time prior to this inspection, but work has now been resumed. (For details, see table, page 167.)

Magnett Mining Co.—George Webster, president; mines located about 5 miles southeast of Carthage, but were not in operation at date of inspection. (For details, see table, page 167.)

Myers & Jennison.—Mine located near the Mo. P. R. R. depot; steam plant; shaft 140 feet deep; new plant was put into operation during the past year; the machinery was removed from the old shaft. Mine gives employment to 15 men, and is worked both day and night. (For details, see table, page 168.)

Pacific Mining Co.—W. B. Myers, superintendent; mine located near Mo. P. R. R. depot at Carthage; shaft 140 feet deep; steam power; new concentrating works have been erected, consisting of crusher, rolls and jigs. The plant gives employment to about 16 hands. (For details, see table, page 169.)

Pleasant Valley Lead and Zinc Co.—Mine located about 3 miles southwest of Carthage; this plant is equipped with concentrating works consisting of crusher, rolls and jigs. About 24 men are employed in and about the mine and cleaning works. (For details, see table, page 169.)

JOPLIN POSTOFFICE.

Acme Mining Co.—C. C. Lowe, superintendent; mine located about 2½ miles east of Joplin; shaft 100 feet deep; entire new plant. (For details, see table, page 163.)

Burch Mining company—W. G. Downing, superintendent. Mine situated about 6 miles east of Joplin. Company does no mining, but the land is leased to sub-operators in lots 200 feet square; at date of inspection two mines were in operation, giving employment to about 22 men; there were also 10 men prospecting upon the land. The shafts which are being worked are from 130 to 145 feet in depth and equipped with crushers, rolls and jigs for cleaning the ore. (For table showing details, see page 164.)

Byers, Murphy & Conners—Charles Glover, agent. Mine located about 2 miles northwest of Joplin. Mines were idle at date of inspection (August, 1891), and had been since April, 1891. (For details, see table, page 164.)

Consolidated Mining company—Mines were closed down about the 1st of August, 1890, and have been idle ever since; however, several men are prospecting upon the property.

Davidson, W. G. & company—Mine located in the northern of part the city of Joplin, in Hight's addition. It is a new plant, having been put in operation during the past year. (For details see table, page 165.)

Diamond Lead & Zinc company—J. W. Spear, secretary. These mines are located in the city limits, but about 2 miles south of Joplin proper.

Several improvements have been made at these mines during the past year, among other things the erection of a concentrating plant at a cost of \$8,500. Both lead and zinc ores are worked, the mineral being found 65 to 90 feet below the surface. In addition to the mines operated by the company, they have others sub-leased, the two together employing about 41 men. There are also about 40 men engaged prospecting upon the property. (For table showing details, see page 165.)

Empire Zinc company.—W. C. Wetherill, general manager; Capt. Daniel Dwyer, mining superintendent.

This is decidedly the most productive mining company in the Joplin district. The output during the past year was exceeded only by a few companies in the southwestern part of the State.

The company's mining property is located in the vicinity of Joplin, most of which is in the city limits, and is divided into three mining camps.

The Eagle mines are the most productive; they are equipped with good machinery for hoisting and cleaning the ores. Concentrating works consist of 1 crusher, 2 sets rolls and 2 single and 4 double jigs. An apparatus has been erected during the past year for cleaning slime (fine silt containing ores). The ores are found from 60 to 110 feet below the surface.

Gray mines—Are situated in the western part of the city near the corporation line. The company is leasing the land to mine operators in lots 200 feet square, who put in machinery and work the ground to suit themselves, paying the company a royalty of 20 per cent for all ores mined. The ores are found at a depth of about 40 feet.

Koh-i-noor mine—This is a new plant, having been put in operation during the past year; it adjoins the city on the west. The cleaning works consist of crusher, rolls, 4 steam-jigs and 2 rotary tables for handling and cleaning slimes.

These three mining camps were giving employment to about 175 hands at date of inspection (August, 1891), besides about 20 men who were prospecting upon the properties. (For table showing details see page 165.)

Ferguson, Jno.—Pat. Wyne, superintendent; mine located about six miles west of Joplin. A new concentrating plant has been erected, consisting of 1 crusher, 2 sets rolls and 2 sets jigs. Land leased to sub-operators in lots 200 feet square, who pay a royalty of 20 per cent on all ore mined. These mines give employment to about 32 men. (For details, see table, page 166.)

Granby Mining & Smelting company—J. H. Stephens, superintendent. This mining property adjoins Joplin on the northwest. The company lease the land in lots 200 feet square to mine operators, who pay a royalty to the company on all ores produced; at date of inspection (August, 1891), ten or eleven shafts were being worked, furnishing employment to about 136 men; there were also about 150 men prospecting. (For details, see table, page 167.)

Great Western Mining company—Robert Ries, superintendent. These are new diggings, the first ore being produced in August, 1890; located about 3 miles east of Joplin. Both lead and zinc are found, but zinc in the greatest quantities. Two mines were in operation at date of inspection (August, 1891), giving employment to about 16 men. (For details, see table, page 166.)

Guinn & Loyd—E. Loyd, superintendent; mine located about 1½ mile southwest of Joplin. Land is leased to mine operators in lots, who pay a royalty to the company on all minerals produced; at this date (August, 1890) there are 4 shafts in operation, giving employment to about 26 men. (For details, see table, page 167.)

Home Mining company—S. H. Claycomb, superintendent; mines opened during the past year; they are located just south of Joplin; land leased to mine operators in lots 200 feet square, who pay a royalty to company on all minerals produced; both lead and zinc are found. (For details, see table, page 167.)

Interstate Mining company—Mines located about 1 mile east of Joplin. The principal mining now being done is on the Rose Mining company lease; here the ore is found from 50 to 100 feet below the surface. (For details, see table, page 170.)

Jasper Mining company—H. Tatcher, superintendent; mines located about 1 mile southwest of Joplin; most of the mining is done by sub-operators who have land leased from company in lots of 3 to 6 acres each; one shaft, however, is being operated by the company; from 45 to 50 men are employed in and about the regular mines, besides about 39 prospecting. Inspection was made August, 1891. (For details, see table, page 167.)

Leckie, W. M.—Mine located about 2½ miles east of Joplin. Mines were idle date of inspection, but was expected to resume operation soon.

McCoy Mining company—J. P. McCoy, superintendent. Mine located about 1 mile west of Joplin. At date of inspection (August, 1891), three mines were in operation on the property, two by sub-operators and one by the company. Both lead and zinc are being worked and the ore is found from 50 to 90 feet below the surface. About 20 men were employed in and about the mines and 12 prospecting. (For table showing details, see page 168).

Napier & Stum—Mine located about 1 mile south of Joplin. Ore found at a depth of 60 feet, but has been worked but little during the past year. (For details, see table, page 168).

New York Land and Mining company—Property located in the corporation of Joplin on the north side of the city. Mines were idle date of inspection, but I understand a company has since been formed for the purpose of putting in machinery and reopening them again. (For details, see table, page 168.)

North Joplin Land company—Chas. Glover, superintendent. Mines adjoin the city on the north. Land is leased in lots 200 feet square to sub-operators, who pay a royalty to company of 25 per cent on all mineral produced; the ore is found from 40 to 50 feet below the surface. (For details, see table, page 169.)

Oswego Mining company—Samuel C. Cooke, superintendent. Mining property adjoins Joplin on the southeast; in fact a part of the property is in the city limits. Both lead and zinc ores are being worked, with the zinc predominating; the shafts from which the minerals were produced vary from 40 to 118 feet in depth.

At date of inspection there were 11 mines in operation that were producing ores, employing about 80 hands, including those employed by the company; besides, about 60 men were prospecting.

The land is leased in lots to mine operators, who sink shafts and operate the mines, paying a royalty of 25 to 35 per cent on all ores produced. (For details, see table, page 169.)

Ozark Mining company—Mines located about 4 miles east of Joplin. This property was formerly known as the Virginia Land Co.

The mines were idle date of inspection, and had been for several weeks, the property being involved in litigation. (For details, see table, page 169.)

Pffenning & company—P. Pffenning, superintendent. Mines located about 6 miles west of Joplin. The land is leased to mine operators in lots, who pay a royalty of 20 per cent on all ores produced. The Banner Mining Co., a lessee, has erected a splendid concentrating plant at a cost of about \$12,500. The ore is found near the surface, and it is worked by open strip pits. (For details, see table, page 169.)

Porter, E. D.—Mine located at Joplin; land leased to mine operators in lots, who sink shafts and operate the mines, paying a royalty of 20 to lessor. At date of inspection (July, 1891), 21 men were employed in and about the mines, besides about 15 who were prospecting. (For details, see table, page 169.)

Porter, E. D. & company—Mines located about 3 miles west of Joplin. Ores on this property have recently been developed by the Jasper M. Co. and Delaware M. Co. The mines now in operation are from 85 to 100 feet in depth.

Rice & James (Mahaska mines)—Located about $1\frac{1}{2}$ mile south of Joplin. The mining tract consists of 160 acres of land, a part of which is leased to mine operators in lots 200 feet square, who pay a royalty to company of 20 per cent on all ores produced. At date of inspection (July, 1891) 12 shafts were being operated by lease-holders, giving employment to about 71 men, besides about 70 who were employed by the company in and about the several different shafts operated by them. There are also about 40 men prospecting upon the land.

Both lead and zinc ores are mined, with the zinc predominating. The ores are found from 40 to 100 feet below the surface. (For details, see table, page 169.)

Snyder Bros. Lead & Zinc company—J. C. Snyder, superintendent. Mines located about 2 miles south of Joplin, on Mrs. Allen's land.

When ore was first struck on this property the company leased a part of the land to sub-operators, charging them 20 per cent royalty. But now the company is making no more leases, but taking charge of the leased mines as fast as the leases expire.

This has been one of the most productive mining properties in the Joplin district. Both lead and zinc are found, but the zinc in the greatest quantities. During the past year the company has erected an excellent concentrating plant, consisting of rolls, crushers and jigs. There were about 66 men employed in and about the mine at date of inspection (July, 1891), and 16 men prospecting. (For details, see table, page 170.)

Spring, Moore & Davis—A. C. Spring, secretary. Mine located about 1 mile east of Joplin. Shaft is 106 feet deep, and gives employment to 6 men. (For details, see table, page 170.)

South Joplin Lead & Zinc company—Mines located at Joplin. At date of inspection (July, 1891) two shafts were in operation, giving employment to 11 men. The concentration works consist of rolls, crushers and jigs. It is reasonably well constructed and in good condition. I made a personal examination of the inside workings and found them in good condition. (For details, see table, page 170.)

Sterling Lead and Zinc Co.—Mines located about 2½ miles northwest of Joplin. Land is leased in lots to mine operators, who pay the company a royalty of 15 per cent on all ore produced. The ore is being worked in three shafts; the average depth of these shafts is about 90 feet. (For details, see table, page 170).

Swarland Mining Co.—P. L. Swartz, superintendent; mines located on Turkey creek about 1 mile north of Joplin. Land leased to mine operators in from 1 to 10 acre lots, who pay a royalty of 10 to 25 per cent on all ores produced; the former price is charged if the land is drained by the mine operator and the later if drained by company. Five mines were in operation date of inspection, giving employment to about 22 men.

Thacker Mining and Smelting Co.—Mines located about 1 mile northwest of Joplin. Company lease land to mine operators in lots 200 feet square, who pay a royalty on all ores produced of 20 per cent. The company operates a concentrating plant in connection with the mines, which is well constructed and in fair condition. At date of inspection (July 1891) there were 6 shafts being operated, giving employment to 34 men; besides, there were about 20 men prospecting. (For details, see table, page 171.)

Tuckahoe Mining Co.—E. Loyd, manager; mines located about 3 miles north of Joplin. At this date there are 4 mines in operation, giving employment to about 40 hands. (For details, see table, page 171.)

Turkey Creek Mining Co.—E. Maffett, superintendent; mines located about 2 miles northwest of Joplin. The company lease the land to mine operators in lots 200 feet square, who pay a royalty of 20 per cent on the ore produced. Considerable improvement has been made at these mines during the past year in the matter of draining. The shafts now in operation are from 80 to 110 feet in depth, and they furnish employment to about 80 men; besides, there are about 100 men who are prospecting. (For details, see table, page 172.)

Windsor Mining company.—E. L. Robertson, superintendent. Mines located about one mile east of Joplin; were formerly known as the Interstate Mining company.

At date of our visit five shafts were in operation, four of which are operated by steam and the other one by horse-power. Two of the shafts are also equipped with crusher and rolls and 1 with steam-jigs. These mines gives employment to about 46 men. (For details, see table, page 172.)

Zinc Hill Mining company.—W. G. Goff, superintendent. Mines located about three miles north of Joplin.

At date of inspection 4 mines were in operation, employing about 23 men, besides 18 that were prospecting. These mines have only been in operation a few months.

LEHIGH POSTOFFICE.

Franklin Zinc company.—Mines located at Lehigh, with J. B. Johnston superintendent. This property is situated along the Center creek bottoms, and a large amount of mineral being found near the stream, it was worked, but in some cases the overlying roof caved, letting the surface-water into the workings, making drainage a serious matter. A levee has been built to turn the stream, but even with that, the mines are in danger of being filled with water by the possible breaking of the levee when the creek is swollen. During the past year the mines have been idle nearly one-half of the time on account of inadequate drainage. But the company is now erecting a central plant, with engines of about 650 horse-power, in order to drain the mines by a system of string pumps. It is hoped when this plant is completed the drainage difficulty will be overcome.

At the date of inspection, August, 1891, about 40 or 45 men were employed in and about the mines, besides 37 who were prospecting. (For details, see table, page 166.)

ORONOGO POSTOFFICE.

Granby Mining and Smelting company.—John H. Stephens, superintendent; mines located at Oronogo. The company lease the land out to mining companies in 12, 18 and 30-acre tracts, and charge them from 10 to 25 per cent on the ores produced. Some of these lease-holders sublease land to miners and mine operators in lots 200 feet square. At date of inspection (August, 1891), eight plants were in operation, furnishing employment to from 45 to 60 hands, besides about 36 prospectors; both lead and zinc are found, with the zinc predominating. (For details, see table, page 166.)

The Alba Mines.—H. Weyman, superintendent; mines located about 4 miles north of Oronogo. This company has just been organized and will commence operation soon; silicate and zinc blende are found; no men were employed at date of inspection.

WEBB CITY AND CARTERVILLE.

Ashcraft, Reynolds & Co.—G. Ashcraft, superintendent; mine located about 2 miles north of Webb City. The ores were recently developed on this property, since which time a good plant for handling the product has been erected; at date of inspection, four shafts were

producing ore, giving employment to 14 men ; besides, there were 8 prospecting. (For details, see table, page 163.)

Center Creek Mining company—Mr. J. C. Stewart, general manager ; mines located at Webb City. This is the largest zinc-producing property in the State ; it furnishes employment to nearly 300 men, and was operating at date of inspection 25 shafts, most of which were operated by lease-holders, who pay a royalty to company on all ores produced. The mines are drained by ten string pumps, which are run by two engines, one 170, the other 220-horse power ; however, only one engine is used at a time. The company also runs a concentrating plant in connection with the mines. The mines known as "Quick Work" adjoin Webb City on the south, and are operated by the company. (For details, see table, page 164.)

Daugherty & Davey—Mines located at Carterville, on the Ealer tract of land.

The company lease land to mine operators in lots 200 feet square, who sink shafts and mine the ore, paying the company royalty of 15 to 25 per cent. At date of inspection, six mines were in operation, giving employment to about 75 men, besides 20 prospectors.

Four concentrating plants are in operation upon the property, but owned by lease-holders. (For details, see table, page 165.)

Daugherty, Davey & Daugherty—Mines located at Carterville, on what is known as the "Corn-field" tract. Land is leased to mine operators in lots, who sink shafts and work the ore, paying a royalty of 22½ per cent on zinc ore. Lead ore is sold to company on what is known as \$25 basis : that is, when pig lead is worth 7 cents per pound in St. Louis, the company pays the operator \$25 per 1,000 pounds for first-class lead ore, and rise and fall in proportion to the rise and fall in said market. At date of inspection, August, 1891, nine shafts were in operation, furnishing employment for about 74 men ; 3 of these shafts are equipped with machinery with which to clean the ores.

Davey, Tower and company—Mines located at Carterville and known as the South Carterville Draining company. Land is leased to mining companies in lots, who pay lessor a royalty on ores produced. Six shafts are producing ore ; however, at date of inspection (August, 1891) only three were in operation, two of which are equipped with machinery with which to clean the ore. (For details, see table, page 170.)

Eleventh Hour Mining company—H. H. Aylor, superintendent ; mines located about 2 miles southeast of Webb City. At date of inspection (August, 1891), there were eleven shafts producing ores. Eight were operated by steam-power and three by horse, giving employment to about 169 men ; besides, there were about 20 men prospecting. (For details, see table, page 165.)

Garrison Lead and Zinc company.—Mines adjoin Webb City on the south. The mines are operated by lease-holders, who pay a royalty to company on all ores produced. At this date (August, 1891), ore is being worked in nine shafts, the average depth of which is about 165 feet. Steam hoisters are in use at four of the shafts. There are 78 men employed in and about the mines, also about 18 prospecting upon the land.

Hough, A. W..—This mine is situated on a town lot in Webb City, and operated by Houghton & Son. It is a steam power; shaft, 130 feet deep, and gives employment to 16 men. (For details, see table, page 167.)

Motley Mining company.—Mine adjoins Carterville on the south. This is one of the best equipped plants in Southwest Missouri. During the past year \$20,000 has been invested in new machinery with which to better clean and handle the ores. Two shafts are now in operation: one 150 and the other 160 feet in depth, which are producing both lead and zinc ore, with the zinc predominating. At date of inspection 51 men were employed. (For details, see table, page 168.)

Nevada Mining company.—W. H. Keeler, superintendent. Mines adjoin Webb City on the northeast. Land is leased to mine operators in lots, who sink shafts and operate the mines, paying a royalty to lessor.

Two shafts were producing ore date of inspection, viz.: Union Mine Co. and Vanfelt & Co., each of which is equipped with machinery with which to clean the ore, consisting of crushers, rolls and jigs.

There were about 39 men employed in and about the mines date of inspection (August, 1891). (For details, see table, page 168.)

Noble Mining Company.—Mines located at Webb City. Steam plant. Shaft 180 feet deep, but drifting at a depth of 166 feet. The mine is equipped with two steam pumps, crusher, rolls and jigs. Twenty men are employed in and about the mine; besides, there are about 20 men who are prospecting. (For details, see table, page 168.)

Steelman, A. T..—Mine located on a town lot in the southern part of Webb City. Shaft is 150 feet deep. Steam power. Gives employment to 12 men. (For details, see table, page 170.)

Tower, Davey & company.—Mines situated at Carterville, and known as the "North Carterville Mining Co." Land is leased to mine operators in lots, who pay a royalty to company on all ores produced. The mines are drained by the company with two large lift pumps, for which an additional royalty is charged. Nine shafts are producing ore; however, at date of inspection, only six were in operation. These shafts vary in depth from 60 to 160 feet; both lead and zinc are produced but zinc is found in the greatest quantity. (For details see table, page 168.)

Tracy Lead and Zinc M. company—J. Hewil. Mines adjoin Carterville on the south; general office in Joplin; company does no mining, but lease the land out to mine operators in lots, who pay a royalty on all ores produced.

The output from this property during the past year has exceeded any mining company in Southwest Missouri except the famous Center Creek M. Co., of Webb City. During the past year the output shows an increase of 134 per cent. There are 28 ore-producing mines on the property; however, only 20 were in operation at date of inspection, August, 1891. These shafts vary in depth from 100 to 200 feet.

There have been several new shafts sunk during the past year and five concentrating plants erected. These mines and concentrating works furnish employment to about 256 men, besides about 50 others who are prospecting upon the land. (For details see table, page 171.)

Troup Mining company—J. W. Grounds, superintendent; mines located about 3 miles southeast of Carterville.

Seven mines are in operation, two of which are operated by the company. Considerable improvement has been made during the past year; among other things, the erection of three new concentrating plants and the putting in of two pumps. Mines and concentrating works give employment to 113 men, besides 12 others that were prospecting upon the land. (For tables of employes, etc., see page 171.)

Victor Mining company—Mines located about $1\frac{1}{2}$ mile southeast of Webb City. This company has a lease on 40 acres of the "Conner tract," upon which these mines are located; at date of inspection two shafts were in operation, each of which is about 175 feet deep.

During the past year one new concentrating plant has been erected. These mines and concentrating works give employment to about 50 men. (For details, see table, page 172.)

ZINCITE POSTOFFICE (BELLVILLE).

Barbee & company—Mine located 1 mile south of Zincite. At this date only one mine is in operation; it gives employment to about 16 men. (For details, see table, page 163.)

Cottonwood Mining company—Mines located about $1\frac{1}{2}$ mile southeast of Zincite. The only shaft in operation is 149 feet in depth; equipped with concentrating plant for cleaning the ore; 19 men were employed upon the land date of inspection. (For details, see table, page 167.)

Gretchen Lead & Zinc M. company—S. Morrison, superintendent. Mining property located about $1\frac{1}{2}$ mile southeast of Zincite. But little work was being done at the mines date of inspection. (For details, see table, page 167.)

Hoff Land & Mining company—This was formerly known as the "Buckeye M. Co." The property is located at Zincite. This company had taken charge of the property a few days prior to our visit, and was doing nothing beyond prospecting. (For details, see table, page 167.)

Johnson & Copley—J. Copley, superintendent. Mines located about $1\frac{1}{2}$ mile south of Zincite, on the Brooks land.

Only one mine was in operation date of inspection; it is a shaft 115 feet deep; steam power, and equipped with crusher, rolls and jigs for cleaning the ore. (For details, see table, page 167.)

Knoble, A. M.—M. C. Lichlider, superintendent. This mining property was formerly owned and operated by the Holden L. & Z. Co., the same having been purchased by A. M. Knoble March 4, 1891.

Four shafts were in operation at date of inspection, each of which is equipped with good steam hoisters, and three with concentrating plants. These mines and concentrating plants give employment to 35 men. (For details, see table, page 167.)

Mineral Creek Land and Mining company.—F. S. Treadway, general manager. Mines located about 3 miles northeast of Zincite, and formerly known as the "Sherwood" mines.

Shaft now in operation is 130 feet in depth; steam-power; 7 men are employed. (For details, see table, page 167.)

Murphy, Pat.—Mines located at Zincite, but postoffice address Joplin. These mines are operated by lease-holders who pay a royalty on all ores produced.

At date of inspection 4 shafts were in operation, giving employment to 34 men; besides, there were about 34 men prospecting. (For details, see table, page 168.)

Standard Lead and Zinc Mining company.—Mr. J. H. Dangerfield, superintendent. This company is incorporated; capital stock \$48,000. Mines located near Zincite, but postoffice Joplin.

At date of inspection 3 shafts were in operation, 2 of which are well equipped with steam hoisters and concentrating plants, the other, a new shaft, having just been sunk. The 3 shafts, together with the cleaning works, give employment to about 39 men. (For details, see table, page 170.)

West Hollow Lead and Zinc company.—Mr. G. Sanson, superintendent. Mines located about $1\frac{1}{2}$ mile south of Zincite. Five shafts were producing ore at date of inspection (July, 1891), 2 of which are equipped with steam hoisters and cleaning works; 1 is owned and operated by the company and the other operated by J. Copley. The

3 other shafts are operated by horse-power. The 5 shafts, together with dressing works, give employment to about 57 men. (For details, see table, page 172.)

JEFFERSON COUNTY.

While the zinc output in this county has shown a decrease from 2,614 tons in 1890 to 2,116 tons in 1891; the lead product has increased from 277 tons to 497 during the same period; and the value of the mineral product shows an increase from \$45,042 in 1890 to \$53,236 in 1891.

Valle Mining Co.—L. J. Rozier, manager, and J. M. Appleberry mining superintendent; mines located about 11 miles southeast of De Soto and from 1½ to 2 miles south of Valle's mines postoffice.

The M. R. & B. T. R. R., which was built from Pevely to Bonne Terre last year, passes directly through the mining property, furnishing all necessary transportation for the product, etc.

This company owns a large tract of land in this and St. Francois counties upon which their mines are located. The depth at which the ore is found below the surface depends largely upon the point of the hill at which the shaft is sunk; some ore has been worked from shafts 180 and 190 feet, but the general average is not more than 100 feet. No fixed rule is employed to mine the ore, but when a cave or fissure containing mineral is struck, it is followed until exhausted or it gets too thin to work with profit. In some shafts these fissures or openings are found level, while in others they are found either dipping or rising, and frequently a circular deposit of ore and clay will be found connecting two caves or fissures together on different levels; the perpendicular deposits are called by the miners "chimneys," owing to their peculiar shape.

The company does not employ miners, but it gives them permission to mine upon the land, buying their product and paying the market value of 400 pounds of lead at St. Louis for 1,000 pounds of lead ore at mines before being smelted, and \$6 per ton for silicate of zinc. The company in addition furnish them houses, fuel, and garden spots free of rent.

I understand that, during the past year, no less than 35 or 40 different shafts have been in operation at intervals; at this date (June 11) about 25 are being worked, employing from 2 to 4 men in each. Two

Scotch hearth furnaces are run in connection with the mines, where the lead ore is smelted, but the zinc ore is shipped to St. Louis to be smelted.

From 100 to 125 men are employed in and about the mines. Wages of employes run from \$1.10 to \$1.50 per day, and smelter men receive from \$2 to \$2.50 per day.

LAWRENCE COUNTY.

The output in this county shows a healthy growth during the past year as compared with the preceding year—the lead output having advanced from 2,873.4 in 1890 to 4,461.6 tons in 1891, and the zinc output from 12,877.1 tons to 15,352.6 tons during the same period.

The value of the mineral product in 1890 was \$324,504, and \$465,697.30 in 1891, an increase over 1890 of \$141,193.30, or 43½ per cent.

Following is a limited description of the property of each mining company. (Table showing character of mines, tonnage and value of output may be found on page 160.)

AURORA POSTOFFICE.

Aurora Zinc company.—Mines located at Aurora; at date of inspection (August, 1891) four mines were in operation, giving employment to about 54 men, three of which are equipped with steam hoisters and two with dressing works. (For table showing details, see page 173.)

Berry, Frank.—Shaft just sunk, no ore having been sold at date of inspection (August, 1891).

Black Land and Mining company.—Jacob Thielen, superintendent mines; adjoins Aurora on the northwest. Company lease land in lots to mine operators who sink shafts and work the ore, paying a royalty on all minerals produced.

At date of our visit (August, 1891), there were 11 shafts in operation producing ore, 3 of which were operated by steam, the remainder by horse power.

Both lead and zinc ores are produced, with the lead ore largely predominating.

About 86 men were employed in and about the mines, and in addition to these there were about 20 men who were prospecting upon the land. (For table giving details, see page 173.)

Brinkerhoff, F. H.—Mines located near Aurora. At date of our visit only 2 mines were in operation upon the land, giving employment to about 14 men, one of which was equipped with cleaning works.

Dayton mining land.—C. M. Dayton, superintendent. Mines located about $\frac{1}{2}$ mile west of Aurora. Land leased to mine operators in lots 200 feet square, who sink shafts and operate the mines, paying a royalty to land owner of 10 per cent on zinc and 20 per cent on lead ores produced.

At date of our visit 6 shafts were in operation producing minerals, giving employment to about 35 men; besides these, there were 16 others who were prospecting. Shafts now in operation vary from 35 to 65 feet in depth. (For table of details, see page 173.)

Decatur Lead and Zinc company.—Geo. Van Riper, superintendent. Mining property located about $\frac{1}{4}$ of a mile northeast of city limits.

Inspection was made of the property in August, 1891, at which time 6 shafts were in operation, 3 of which were equipped with steam hoisters. These 6 mines were giving employment to about 23 men, besides several who were prospecting upon the property. (For table showing details, see page 173.)

Kentucky Mining company—Geo. Van Riper, superintendent; mines located about 1 mile east of Aurora. Company do no mining, but lease land in lots to mine operators, who sink shafts and operate the mines, paying a royalty on all ores mined. At date of our visit (August, 1891), five shafts were in operation, two of which were equipped with steam hoisters, and one with a concentrating plant; these mines furnish employment to about 47 men, besides 20 others who are prospecting upon the land. (For table showing details, see page 173.)

Liles, T J.—Mines located at Aurora. At date of our visit (August, 1891), nine shafts, varying in depth from 15 to 80 feet, were in operation producing mineral. Two of the mines are equipped with steam hoisters and one with a concentrating plant. About 34 men were employed in and about these mines, and in addition there were 8 other men prospecting. Both lead and zinc are found, with the lead predominating. (For table of details, see page 174.)

Louisville Zinc and Lead Mining and Smelting company—W. M. Johnston, superintendent; mining property adjoins Aurora on the east. At date of our visit five shafts were in operation, one of which was equipped with steam hoister; hoisting was being done at the other mines by horse power.

Two steam pumps, one 30 horse power boiler, a 25 horse power engine and crusher have been erected upon the property during the past year; 49 hands were employed in and about these mines; besides, there were 6 other men who were prospecting upon the land. (For table of details, see page 174.)

Midland Mining company—Geo. Van Riper, superintendent; mines located near Aurora. At date of inspection but little work was being done in the mine; however, several men were prospecting upon the land. (For details, see page 174.)

Missouri Mining company—C. F. Johnston, superintendent; mines located about 1 mile east of Aurora. Company lease land in lots to mine operators who sink shafts and work the ground, paying a royalty to company on all ores produced. Nine shafts were producing ore, date of our visit, giving employment to about 44 men; besides, there were 18 men prospecting. (For table showing details, see page 174.)

New York Land and Mining Co.—Mine located about one-half mile east of Aurora. Four shafts in operation date of inspection (August, 1891), giving employment to about 19 men. One concentrating plant has been erected upon the land during the past year. Geo. Van Riper is superintendent. (For table showing details, see page 174.)

Ozark Range Mining Co.—C. F. Johnston, superintendent. Mines located about three-fourths of a mile east of Aurora. Three shafts were in operation date of our visit, all of which were equipped with steam hoisters and one with a concentrating plant. These three mines give employment to 27 men. (For table showing details see page 174.)

Rinker Lead and Zinc Co.—J. L. Rinker, superintendent. The mining property adjoins Aurora on the east. Company do no mining, but lease land in lots to mine operators, who sink shafts and work the ground, paying a royalty on all ores produced.

At date of our visit about 16 or 18 shafts were in operation, varying from 30 to 106 feet in depth. Three of these shafts are equipped with steam hoisters, and one with concentrating works; these shafts give employment to about 70 men, besides there being 25 others who are prospecting upon the land. (For details, see table, page 175.)

Harry Wood Mining company, and Shorton Crusher company.—Are each operating custom concentrating plants upon the land. These two plants crush and clean a great deal of disseminated ores, produced by individual operators.

St. Louis and Aurora Mining company.—L. W. Hubbell, manager. This property has recently been developed; it is located about 1½ mile east of Aurora. No ore had been shipped date of inspection.

Vance Land.—J. T. Vance, owner of land; located about one mile north of Aurora.

At date of our visit seven shafts were in operation, six of which were equipped with steam hoisters. These seven mines furnish employment to about 68 men; besides, there were about 36 others prospecting. (For details, see table, page 175.)

PEIRCE CITY POSTOFFICE.

Peirce Mining company.—H. V. Worley, secretary. Mine located about six miles northeast of Peirce City. The shaft was sunk during the past year, and a good concentrating plant erected at a cost of about \$3,000; but this was burned down in June, and had not been rebuilt at date of inspection (August, 1891); I was informed, however, that it was the intention of the company to rebuild the plant as soon as convenient.

MADISON COUNTY.

This county reports an output of 3,431.3 tons of pig lead during the past year, valued at \$268,328; an increase of 398.7 tons over the previous year, with an increased value of \$29,237.44.

Mine LaMotte.—Owned and operated by Rowland Hazard; W. B. Cogswell, agent; J. D. Sanders, superintendent. Mines are located at Mine LaMotte postoffice, about 4 miles northeast of Fredericktown.

The lead ore is now being worked from 3 vertical shafts, varying from 100 to 150 feet in depth; it is disseminated in magnesian limestone; some copper, nickel and cobalt are also found. Dressing works, furnaces and a machine shop are run in connection with the mines, which furnishes employment to 288 hands (this includes men working in and about mines). Wages of mine employes vary from \$1.15 to \$1.75 per day—miners receiving \$1.25 to \$1.35, and foremen \$1.75 per day. The wages of employes have been advanced 5 per cent during the past year.

Following is a partial description of each mine, with a statement as to the condition they were found in at date of inspection (June 16):

Mines Nos. 1 and 2.—These mines are connected together by underground roadways, and as all the ore is hoisted out of Mine No. 1, therefore, they are practically one mine.

Machinery for hoisting, safety catches and cages in good condition. The ore is worked from two levels, separated by about 16 feet of white limestone. Ventilation reasonably good; mine well drained.

Mine No. 4.—Steam plant; machinery, cages and safety catches in good condition. Ventilation and drainage reasonably good.

Mine No. 5.—Shaft about 150 feet deep; equipped with good machinery. The ore dips to the southeast, hence it is that water lies along the working face of main gangway, but mine is kept drained as well as it is possible.

The method of ventilating these mines is good; a rock wall is built from one pillar to another, forming a solid wall from the shaft-bottom to head of work, around which the air current passes.

These mines are well managed and run strictly in compliance with the mining law.

MILLER COUNTY.

Lead ore is worked by so many different parties, and in such small quantities, that we deemed it advisable to secure the output through the Miller County Mining and Smelting company, the company which smelted the ore produced. The ore is found near the surface, and is worked by farmers at odd times when not employed upon their farms. It is said to be a splendid quality of ore, producing from 70 to 72 per cent pig lead.

The above named furnace is located about 7 miles north of Tusculumbia and 10 miles south of Olean. Mr. P. T. Hauenstein, of Tusculumbia, is secretary of the smelting company.

Following are the names, with postoffice addresses of the parties who produced the ore smelted at this furnace during the past year: Robert Pinkston, B. Roberts, Isaac Shade, L. E. Miller, J. M. Buster, Tusculumbia; W. J. Hilsel, J. Roark, J. Kinsley, E. G. Stephens, Pleasant Mount; Sheckells & Co., Maries Home; Gorden & Henderson, E. A. Becker, Spring Garden.

MORGAN COUNTY.

The mining industry in this county has been somewhat revived during the latter part of the past year. A number of parties are prospecting 5 to 7 miles southwest of Versailles, with reasonably good indications of ore in paying quantities.

The Big Three mine, located about 6 miles southwest of Versailles, is the principal producing mine. This shaft is equipped with hoisting machinery, which is in fair condition; Mr. Frank McConnell is the manager. A prospect shaft is being sunk by the Crystal Mining company, probably $1\frac{1}{2}$ mile northwest of Big Three mine, with good indications of striking mineral. Some lead ore is being taken out as the shaft goes down, but not enough to pay. I am informed that a great deal of surface mineral (lead ore) was taken off of this property several years ago.

The Bluff Spring mine has been idle during the past year, but I am told that it has been leased to Fred. Santhoff and others, who are preparing to put the mine in operation again.

NEWTON COUNTY.

This county has shown a decrease in the output of both lead and zinc during the past year, as compared with the report of 1890. That report shows an output of 1,757.5 tons of lead, and 8,285.4 tons of zinc, which was valued at \$253,906; while this report shows the product to be 1,504.6 tons of lead and 7,900.7 tons of zinc, with a value of \$219,723.70—a decrease in lead output of 252.9 tons, of zinc 384.7 tons, with decrease in value of \$43,182.30.

The mining companies reported are as follows:

GRANBY POSTOFFICE.

Granby Mining and Smelting company—John Kingston, superintendent. This company does no mining, but the land is leased in lots to miners, who form companies among themselves to operate the mines, selling the product to the company, basing the price on the market value of ore in St. Louis—the company furnishing the machinery with which to drain the mines.

Both lead and zinc ores are found. The lead is smelted at the company's smelter at Granby, but the zinc ore is shipped to Pittsburg, Kansas, to be smelted. Dressing works for cleaning zinc ore consist of one crusher, two sets of rolls, and seven sets of three and four-sieve jigs, one set having been erected during the past year. The concentrating works for treating lead ore consist of one crusher, one set of rolls, and three sets of four sieve jigs. The lead ore is reduced by two Scotch hearth furnaces. Fumes originating from the smelting ore, and containing considerable mineral, which formerly passed away in the smoke and were lost, are now caught by conveying the smoke through chambers and trails from three to four hundred feet in length. By this means the smoke is cooled, the fumes settle, falling in the chamber or trail. It is then collected and resmelted. Mr. Kingston, superintendent, informed me that about 10% of the ore smelted is saved by this process. (For details see page 175.)

Ben Harrison Mine.—M. D. Williams, superintendent. Mine is located on Mike Fishel's land; shaft was opened during the past year, and is 35 feet in depth.

JOPLIN POSTOFFICE (JASPER COUNTY).

The following mines, which are reported under the heading of Joplin postoffice, are located within a few miles of Joplin and properly belong to the Joplin district, but as they are located in Newton county, hence come under that county.

Emilie Zinc company—A. W. Sewall, general manager. Mine located about 3 miles south of Joplin. This company is incorporated with a capital stock of \$300,000. Only one shaft was producing ore at date of inspection; it is 120 feet deep, employing about 13 hands. (For details, see table, page 175.)

Johnson mines—George Backman, superintendent. Mines located about $3\frac{1}{2}$ miles southeast of Joplin. But little ore has been produced at these mines during the past year. At this date 10 men are employed in and about the mines, besides 7 who are prospecting. (For details, see table, page 161.)

McClelland & Maupin L. & M. company—T. J. Maupin, superintendent. Mine located about $4\frac{1}{2}$ miles southwest of Joplin. At date of our visit the company was sinking a new shaft. Ore is found at a depth of about 18 feet. (For details, see table, page 161.)

Modoc Mining company—Dr. Evans, superintendent. Mine located about three miles south of Joplin. Mines were idle at date of our visit. However, 6 men were prospecting upon the land. (For details, see table, page 161.)

Morrison Zinc Mining company.—W. W. Morrison, superintendent. Mine is located about five miles southwest of Joplin. This mine was put in operation during the latter part of the year. A concentrating plant has been erected, consisting of one crusher, two sets rolls and two sets steam jigs. Mine was idle date of our visit, hence no inspection was made of the inside workings.

Norton Land and Mining company.—Mines located about three miles south of Joplin; they were idle at date of our visit, but some prospecting was being done. (For details, see table, page 161.)

Roaring Springs Mining company.—Mines located about $4\frac{1}{2}$ miles southwest of Joplin.

Company lease land in lots to mine operators, who sink shafts and work the mines, paying the company a royalty on all ore produced.

At date of our visit, seven shafts were producing ores, four of which were operated by steam and three by horse power. These seven shafts furnished employment to about 51 men, besides 79 who were prospecting upon the land.



Both lead and zinc ores are found, with the zinc largely predominating. (For details, see table, page 176.)

Ruby Lead and Zinc company.—J. B. McGraw, superintendent. Mines located about two miles south of Joplin.

Considerable improvement has been made during the past year, chief among which was the erection of cleaning works.

Mines were idle at date of visit. (For details, see table, page 161.)

RACINE. POSTOFFICE.

Henderson, R. I.—Mine located about two miles northeast of Racine. The ore is found from 6 to 70 feet below the surface, and usually worked by leaseholders; however, no mines were in operation date of inspection.

Wainwright Bros. & Newman.—Mines located about 2 miles northeast of Racine. Mines were idle at date of inspection (July, 1891), and had been for several days. However, Mr. G. W. Buzard, the superintendent, informed us that prospecting would soon be commenced with a drill.

SAGINAW POSTOFFICE.

Fredonia Mining company.—C. J. Mansfield, superintendent. Mines located near Saginaw, but postoffice address of company is Joplin, Jasper county.

These mines were put in operation during the past year, and are at this date producing both lead and zinc ore; however, no zinc has yet been sold. Three shafts are producing ore, furnishing employment to 16 men besides 10 who are prospecting. (For details, see table, page 175.)

Splitlog Mining company.—B. J. Hobson, superintendent. Mine located at Saginaw. It is a new plant put in operation since June, 1891. No ore has been sold up to date of inspection (July, 1891).

SENECA POSTOFFICE.

Potwin, C. A.—Mine located about $\frac{1}{2}$ mile south of Seneca railroad depot. Shaft is 138 feet deep, but ore worked at about 55. During the past year a new hoisting engine and crusher have been erected. The plant gives employment to about 27 men; John R. Holmes is mine superintendent. (For details, see table, page 161.)

Seneca Lead and Zinc Mining company.—Charles Huber, manager. Mine located about $1\frac{1}{2}$ mile east of Seneca. The mine has been opened during the past year. Two shafts were in operation at date of inspection (July, 1891), furnishing employment to about 25 men.

A concentrating plant has been erected, which consists of crusher, 2 sets rolls and 3 steam jigs, all of which are in good condition. J. Henderson is mine superintendent.

SPURGEON POSTOFFICE.

Spurgeon mine.—On Hay's land; but little work has been done at these mines during the past year. What ore was produced was mined by J. L. Hampton and Henry Bryant.

WENTWORTH POSTOFFICE.

Peirce City Mining company.—J. W. Garetson, secretary. Mines located at Wentworth. Zinc ore only was produced during the past year.

ST. FRANCOIS COUNTY.

This is the greatest lead-producing county in the State, and from the present outlook it is likely to continue so.

The output of pig lead for the year ending June 30, 1891, was 16,537½ tons, valued at \$1,311,961.

There were 831 persons employed in and about mines, concentrating plants, furnaces, etc.; this does not include, however, those employed on Flat river.

The mineral recently discovered on Flat river has interested a number of parties who are doing a great deal of prospecting with diamond drills; and shafts are being sunk by the Doe Run Lead company, Central Mining company and Judge W. R. Taylor—the Desloge Consolidated Lead company having already sunk a shaft which is producing ore.

We are indebted to Judge W. R. Taylor, of Farmington, Missouri, a gentleman who has had large experience in mining and prospecting in Southeast Missouri, for the following letter, which explains itself:

FARMINGTON, Mo., June 22, 1891.

Hon. C. C. Woodson, State Mine Inspector, Jefferson City, Mo.:

DEAR SIR—Yours of the 18th inst., asking for information in regard to the mining outlook in Flat River district, in this county, is at hand. Any information I have I will cheerfully give, and perhaps could furnish a much more ample and complete statement if I knew just what character of information you are seeking. I herewith hand you a diagram of my tract of land, on which I am sinking a prospect shaft, having previously prospected with a diamond drill, and traced a stratum of disseminated ore for more than half a mile, with here and there a drill hole, all of which show a very flattering prospect for valuable mines. The general course of the stratum as traced and prospected is about 10° N. W. to 10° S. E., the width of

which has not been ascertained by me, with an average thickness of from 10 to 20 feet, at a depth from the surface of from 160 to 285 feet. This, I think, is the upper stratum. I have never sought to find or prospect for the lower stratum, which I have no doubt exists.

My tract contains 1,135.15 acres of land, and is situated in township 36 and 37 N., R. 5 E., and by reference to the diagram herewith sent, you can readily see how it is located with reference to adjoining lands on which valuable leads of disseminated lead ore have been found with diamond drills. Desloge's mine on N. W., Doe Run shaft and Central Mining Co.'s shaft on S., Rosenthal, Burks & Co. and Crawley's on S. E., within a short distance of each other. All of these tracts have been prospected with drills, showing, as I am informed, large bodies of ore. A shaft has been sunk on Desloge's tract, and cross drifts have been run and extensive deposits of disseminated ore have been found. Shafts are being sunk on Doe Run tract, Central Mining Co. and Taylor's tract.

The shaft on Mr. Taylor's tract is being sunk by contract, and is now down about 180 feet and is to be sunk to the depth of 207 feet. Have about 10 to 15 feet of disseminated ore, as indicated by diamond drill.

I give it as my opinion that this Flat River district will prove to be the center of the great deposits of disseminated ore running through from Mine LaMotte, in Madison county, to the St. Joe Lead Mines in St. Francois county, a distance of 30 miles, at which two points the character of the ore crops out. The Doe Run property is situated on section 16, township 35, N. R. 5 E., and the several mines shown on the diagram are located between Mine LaMotte and St. Joe mines, and sooner or later that district between these extreme points will, at intervals, be dotted with mines. The extension to Doe Run mine of the Mississippi River & Bonne Terre railroad, passes west of my shaft about 100 yards, and immediately by the Doe Run shaft on Flat River. I am therefore led to believe that the outlook for the Flat River district is exceedingly bright and flattering.

I am at a loss to know why the capitalists of St. Louis will go west to invest their money when they have a much better opportunity to better invest at their doors. You will please excuse the zeal that I seemingly show in this matter, but I have simply given you my honest convictions in the premises, and if I have failed to give you the information desired, it is because I am not fully aware of the information desired.

Very respectfully yours, etc.,

W. R. TAYLOR.

Desloge Consolidated Lead Co.—F. Desloge, superintendent. This company owns about 2,100 acres of mineral land lying between Big river and Flat river. One shaft has been sunk and equipped with good machinery; it is 220 feet deep; prospect drifts have been driven off from the bottom of shaft about 700 feet, with flattering prospects. The mineral is disseminated in magnesian limestone, hence concentrating works will have to be erected before the ore can be prepared for market. At date of inspection about 25 men were employed.

Doe Run Lead Co.—J. W. Jones, president, and F. P. Graves, assistant superintendent; mines located at Doe Run. The only ore produced is lead; it is found disseminated in magnesian limestone, and

worked from two levels separated, at the hoisting shaft, by about 45 feet of magnesian limestone; however, in some places the two ore-bearing strata run together. Drilling is done by machinery, which is run by compressed air; the air from drilling machines, pumping engines, etc., greatly assists ventilation. An escapement shaft is connected with main hoisting shaft, and is equipped with a good stairway for ingress and egress.

Concentrating works consist of 4 crushers, 4 sets rolls, 20 jigs (roughers), and a great number of fine jigs; however, not all of the machinery is in use at any one time.

The company has recently purchased a large tract of mineral land on Flat river, which has been prospected with diamond drills, with flattering results, upon which two shafts are now being sunk. Mr. Graves informs us that they expect to strike the mineral at a depth of 380 to 400 feet. These shafts are being sunk on the line of the M. R. & B. T. R. R., which is now being extended from Bonne Terre to Doe Run.

During the past year about \$25,000 have been expended in making improvements and developing the Flat river property.

This company gives employment to about 205 persons, divided as follows: 74 miners and mine laborers, 91 employed in and about concentrating works, furnaces, etc., at Doe Run, and 40 developing mines on Flat river. Wages vary from \$1.10 to \$2.10 per day, underground men receiving from \$1.20 to \$1.50 per day for shift of 8 hours. The wages of employes have been advanced 10 per cent during the past year.

St. Joe Lead company.—J. Wyman Jones, president; C. B. Parsons, superintendent, Gust. Setz, assistant superintendent. These mines are located at Bonne Terre, with general office at New York.

This is said to be the largest establishment of its kind in the United States. During the past year 13,817½ tons of pig lead were produced. In producing this amount of lead 666 men were employed in and about the different departments, as follows: mining 359, concentrating plant 131, calcining and smelting furnaces 176.

Wages of employes have been advanced during the past year 10 per cent. Underground men now receive from \$1.25 to \$1.65 per shift of 8 hours, and foremen from \$2 to \$2.25.

The mineral is found disseminated in magnesian limestone overlaid with an excellent rock roof. All underground machinery, such as pumping engines, drills, etc., is run by compressed air, which is generated by four large air compressors.

Concentrating works consist of ten crushers, ten sets rolls, and a great number and variety of jigs. The following three mines were in operation date of inspection :

Shaft No. 1.—Steam power ; shaft 206 feet deep ; the roadways and underground workings are connected with several air and escape-shafts, at least two of which are equipped with stairways or ladders. The main gangway from shaft bottom is over 5,200 feet in length, all of which is laid with double track.

About 160 men and 24 mules were employed in this shaft at date of inspection, divided into three 8-hour shifts.

Mine No. 4.—Is a steam plant ; shaft 140 feet deep.

This mine has been put in operation during the past year ; it is equipped with good machinery for hoisting, etc.

Mine well drained and fairly well ventilated.

Mine No. 5.—Is also a steam plant ; shaft 250 feet deep. New mine put in operation during the past year.

WASHINGTON COUNTY.

Lead ore is or has been mined in nearly every township in the county, and is usually found near the surface ; however, several shafts at Palmer are being worked at a depth varying from a few feet to 132 feet, and some few have been worked to a depth of 100 feet at Potosi and Richwood.

Statistics were collected from the smelting companies, this being the only practicable way that could be adopted, owing to the method employed in the mining. All the ore mined was smelted by eleven smelters located at different places throughout the county, and was mined by farmers and farm laborers at odd times. The Palmer Lead Co. and Abbeyville Mining and Smelting Co. are the only companies in the county employing miners ; the other companies simply buy the ore from the miners, and if the ore was mined from the smelting company's land, so much is deducted as royalty. It must be distinctly understood that the number of employes reported do not represent the number of miners in the county, but only those employed by the two above named companies.

Barytes is mined very extensively in this county, and is of nearly as much importance as the lead industry. (For table showing character of mines, tonnage and value of output, see page 162.)

CADET POSTOFFICE.

Shibboleth Lead Mining company—Mr. J. B. Lathy, secretary. Company's smelter located about $1\frac{1}{2}$ mile west of Cadet; they do no mining, but purchase the ore produced by the miners. There were 215 tons of ore smelted by the company during the past year; it was produced on land owned by the following parties: Mrs. L. B. Bone, Capt. Richardson, Shibboleth Lead M. Co. and others.

FERTILE POSTOFFICE.

Z. T. Higginbotham—Owns a small air furnace, which is used in smelting the ore produced in the neighborhood. The ore is found near the surface, and is worked by individual operators. (For details, see table, page 162.)

OLD MINE POSTOFFICE.

Union Mining & Smelting company—Mr. John B. Long, superintendent. This company own several thousand acres of mineral land lying in the county. They employ no miners, but all ore mined by the men of that locality is purchased by the company. If the ore be mined on company's land, a certain per cent is deducted as royalty. Barytes is also worked on the same principle, and is of nearly as much importance to the company as lead ore. The superintendent informed me that about 1,500 tons of barytes is shipped annually. During the past year there were 211 tons of lead ore mined on the land owned by the Missouri Lead Mining Co., C. B. Gray, U. M. & S. Co. and others.

The ore is worked by individual miners, and is found near the surface. I am told that in fall and winter more than a 100 men and boys are employed mining lead and barytes, but in summer there are but 12 to 20 so engaged, the others being employed upon farms, etc.

Lead ore is smelted by the company at Old Mine postoffice. (For table showing details, see page 162.)

Mrs. L. J. White—Smelter located at Old Mine, and operated by J. D. Lowery. The lead output from the land owned by Mrs. White and adjoining lands, which was smelted at this furnace during the past year, amounted to 100 tons. (For details, see table, page 162.)

PALMER POSTOFFICE.

Palmer Lead company—Mr. F. F. Blunt, superintendent. This company own several thousand acres of mineral land lying in the county; they also operate three air furnaces at mines. The ore is found near the surface and also at a depth of 90 to 130 feet below the surface. The surface mines are worked by individual operators; the deep shafts are sunk by the company, then rented to mine operators who give company a part of the ore produced, the amount varying according to the prospect, etc.

During the past year 517 tons of lead ore have been produced. About 71 men were employed at date of inspection (August, 1891), their wages varying from 75c to \$1.25 per day. (For table showing details, see pages 162 and 177.)

POTOSI POSTOFFICE.

J. P. and R. M. Bugg—Lead furnace, located $1\frac{1}{2}$ mile west of Potosi. The lead smelted by this company is produced from the McArthur Bros. land. Output for year was 338 tons lead ore. There is also a great deal of barytes shipped by this company each year. From 50 to 60 men are employed mining in fall and winter, but only 20 or 30 in summer. (For details, see table, page 162.)

James Long—Furnace located near Potosi. The ore was mined on the McArthur Bros. land; it is found near the surface and worked by individual miners. During the past year 200 tons of lead ore were produced, besides a great deal of barytes. From 20 to 40 miners are employed in fall and winter, but few in summer. (For details, see table, page 162.)

Long, Wm.—Smelter located about 7 miles northwest of Potosi. The ore smelted by this furnace was produced from the land owned by A. Walker, Wm. Long, John Criter and others. (For table showing details, see page 162.)

RICHWOOD POSTOFFICE.

Moran, Charles.—Furnace located about 3 miles east of Richwood. Mr. Charles A. Stocking, agent. The ore smelted at this furnace was produced on the land owned by John L. Thomas, Charles Moran, Page & Co. and C. C. Ross. Ore is worked by individual operators and is found near the surface. (For details, see table, page 162.)

Flynn, J. & M. M.—Smelting furnace located at Richwood. The company employ no miners themselves, but give them permission to mine upon their land, for which a certain per cent is charged on all ore mined. Most of the lead ore is found near the surface, but some,

however, has been mined at a depth of 100 feet below the surface.

The names of the parties owning the land that produced the ore herein reported are, C. C. Ross, Eugene Godat, Flynn Bros. and others. (For table showing details, see page 162.)

Abbyville Mining and Smelting company.—J. S. Carter, manager. Smelter and mines are located $6\frac{1}{2}$ miles southeast of Sullivan, Franklin county—Sullivan being the postoffice, but mine is located in Washington county. The plant was erected during the past year and consists of hoisting engine, pump and smelter. (For table showing details, see page 162.)

Table IX—Showing Character, Tonnage and Value of Output of Lead and Zinc Mines in Missouri for the year ending June 30, 1891.

County.	Machinery in employes' use.							No. of men prospecting	Total number of tons mined.		Av. value per ton at mines.		Amt. received for the year's output of		Total amount received for year's output of lead and zinc.
	No of mines	Boilers	Pumps	Crushers	Rolls	Jigs.	Hand.		Miners	Other employes	Total employes	Lead	Zinc	Lead		Zinc
Barry	8	1	1	1	1			9	18	22	2	575.00	\$17.00	\$9,775.00	\$9,775.00
Christian												20.00	\$40.00	\$800.00	1,760.00
Cole												46.00	44.00	9,024.00	2,024.00
Dade	4	1	4					15	10	25		87.00	48.00	4,900.50	17,846.70
Franklin												281.00	44.00	10,164.00	10,164.00
Greene	18	6	4	2				36	47	83	19	200.10	48.53	9,710.97	30,709.75
Jasper	838	268	268	108	44	112		1,116	1,364	2,500	1,054	7,194.00	95.376.00	2,220,582.03	2,611,724.50
Jederson	80	45	58	14	9	8		100	16	116	4	4.87.00	48.53	391,128.47	53,286.00
Lawrence	104	45	58	14	9	8		313	358	671	168	2,118.00	43.00	21,871.00	465,687.30
Madison	8	7	5	1	2	12		171	117	288	3	4,461.61	51.78	231,041.97	288,598.44
Miller												3,481.31	78.20	288,598.44	288,598.44
Moniteau												14.50	45.00	725.00	725.00
Morgan								2	1	3		8.00	23.00	185.00	236.00
Newton	56	48	44	8	4	17		233	184	407	163	1,504.60	40.00	920.00	920.00
Perry												40.00	17.70	70,894.65	210,723.70
St. Francois	4	39	24	18	14	124		960	471	831	40	15.00	45.00	189,529.08	675.00
Washington	7	2	2					52	67	119		16,837.50	*79.83	1,311,981.00	1,311,981.00
												1,850.25	47.65	88,180.53	88,180.53
*Pig lead.												19,988.81	79.13		
Totals	610	401	404	147	74	273		2,897	2,668	5,065	1,450	16,125.19	21.60	2,411,899.46	5,084,462.83

Character, Tonnage and Value of Output of Lead and Zinc Mines in Missouri for Year Ending June 30, 1891.

BARRY COUNTY.

Name of firm, person or company operating mines.	No. of shafts	Machinery in use.				Employees.	No. of men prospecting	Total No. of tons mined.		Av. value per ton at mine.		Amount received for year's total output.		Total amount received for the year's total output.
		Boilers	Pumps	Crushers	Rolls	Jigs.		Lead	Zinc	Lead	Zinc	Lead	Zinc	
Drake Mining Co.	2	1	1	1	1	8	15		525.00		\$17 88		\$9,125 00	\$9,125 00
Kelley & Anderson.	1					2	4		50 00		13 00		650 00	650 00
Totals.	3	1	1	1	1	5	23		575 00				9,775 00	9,775 00

CHRISTIAN COUNTY.

Reported by David Wolf								20.00	40.00	\$40 00	24 00	\$500 00	960 00	1,760 00
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COLE COUNTY.

Woodworth, J. D.								46.00		44 00		2,024 00		2,024 00
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DADE COUNTY.

Allen & Hughes							15	10	25				8,079 00	8,074 00
Corry Mining Co.	1	4				8						4,200 50	250 00	
Southwestern Mining Co.							87	50		48 00	10 00		1,698 00	
Thurman, J. W.									302 00		10 50		3,696 20	
Totals	1	4				8	15	10	25			4,200 50	13,646 20	17,846 70

Character, Tonnage and Value—Continued.

JASPER COUNTY—Continued.

Name of firm, person or company operating mines.	Machinery in use.			Employees.		No. of men prospecting	Total No. of tons mined.		Av. value per ton at mine.		Amount received for year's total output.		Total amount received for the year's total output.				
	Boilers...	Pumps...	Crushers...	Rolls...	Jigs.		Hand.	Miners...	Other employees...	Total employees...	Lead...	Zinc...					
Gunn & Lloyd.	6	1	1				12	15	27	10	185 75	633 25	\$51 85	\$35 41	\$9,659 84	\$24,453 75	
Hoff Land and Mining Co.	2	2	1				6	10	22	12	1 50	18 25	56 00	21 69	84 00	352 49	486 49
Home Mining Co.	1	1	1				4	6	10	4	3 50	210 00	46 00	23 50	161 00	4,895 00	5,290 00
Hough, A. W.	1	1	1				4	6	10	4	65 00	44 00	64 00	20 00	4,150 00	1,100 00	5,290 00
Jasper County Mining Co.	1	2	6				21	19	40	39	79 31	400 00	21 00	20 00	1,586 20	1,586 20	1,586 20
Jasper Mining Co.	4	7	6				8	5	13	8	19 00	1,154 76	52 24	24 85	992 56	8,400 00	8,400 00
Johnson & Copley	1	1	1				2	18	17	35	4 50	91 00	50 00	992 56	29,191 84	29,191 84	
Johnson, A. M.	1	1	1				3	8	10	10	3 50	97 00	62 00	271 00	2,002 00	2,002 00	2,002 00
Knoble, W. M.	3	2	2				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Leckie, J. F.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Magnet Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Martin, Clotts & Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
McFar & Young	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Mineral Creek Land and Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Missouri Zinc Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Motley Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Murphy Land	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Myers & Jamison	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
McCoy, I. P. Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Napier & Strum.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
New York Land and Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Nevada Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Noble Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Tower, Davey & Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
North Joplin Land Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
North Joplin Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Ozark Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Pacific Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Pleasant & Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Pleasant Valley Lead and Zinc Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Porter, E. D.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Porter, E. D. & Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Reynolds, J. A.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Rice & James	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Roaring Springs Lead and Zinc Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50
Interstate Mining Co.	1	1	1				2	5	7	8	45 25	380 00	23 00	2,279 50	2,496 50	2,496 50	2,496 50

Sargent, John B.	1	1	1	1	1	2	2	4	4	4	25	7 00	48 00	95 00	204 00	175 00	379 00
Smith & Moeller	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Snyder Bros.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Spring, Moore & Davis	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Stavey, Tower & Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
South Joplin Lead and Zinc Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Standard Lead and Zinc Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Steedman, A. T.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Stirling	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Swartland Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Swartland Mining and Smelting Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
The Allyn	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Tracey Lead and Zinc Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Troun Lead Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Tucker Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Tucker Creek Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Victory Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
West Hollow Lead & Zinc Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Williams Crushing Works.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Windoor Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Zinc Hill Mining Co.	1	1	1	1	1	2	2	1	2	8	31	46	66	16	385 00	7,358 00	4,350 00
Totals.	386	253	286	108	44	112	679	1116	1384	2500	1054	7,994 00	95,376 00	48 98	331,168 47	2,220,542 08	2,611,724 50

JEFFERSON COUNTY.

Valle Mining Co.	30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Totals.	30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Character, Tonnage and Value—Continued.

LAWRENCE COUNTY.

Name of firm, person or company operating mines.	Machinery in use.				Employees.		No. of men prospecting.	Total No. of tons mined.		Av. value per ton at mine.		Amount received for year's total output.		Total amount received for the year's total output.	
	Boilers. . . .	Pumps. . . .	Crushers . . .	Rolls. . . .	Jigs. . . .	Hand. Steam		Miners. . .	Other employees. . .	Total employees. . .	Lead.	Zinc.	Lead.		Zinc.
No. of shafts. . . .															
Aurora Zinc Co.	4	3	2	2	3		28	28	54	20	2,372.00	1,254.00	\$30.00	\$25,690.00	\$35,690.00
Black Land Mining Co.	15	4	2	1	7	23	47	39	86	4	59.50	306.00	13.80	8,117.10	133,533.10
Brinkerhoff Mining Co.	16	4	2	3	7	20	30	50	4	38.00	306.00	38.00	17.59	5,417.72	6,942.42
Dayton Mining Co.	7	1	1	1	9	17	18	35	16	227.00	288.77	12.60	9.60	3,638.50	12,718.50
Deatur Lead & Zinc Co.	6	3	2	1	9	12	11	23	8	610.18	601.35	16.31	35.29	9,812.59	45,471.50
Kentucky Mining Co.	6	3	2	1	8	23	24	47	20	291.00	673.00	30.00	12,267.00	18,532.00	25,769.00
Lisles, T. J. (land).	9	4	3	1	2	4	22	12	34	8	185.00	1,104.00	9.50	19,000.00	32,080.00
Louisville Lead & Zinc Co.	6	2	3	1	20	20	29	49	6	170.00	1,763.00	14.48	7.140	25,544.42	33,080.00
Midland Mining Co.	9	4	2	1	1	2	1	8	6	88.00	963.00	45.00	14.14	9,077.99	10,787.99
Missouri Mining Co.	4	2	2	1	14	21	22	43	5	30.00	155.50	16.90	1.470	2,360.00	3,750.00
New York Land & Mining Co.	4	3	1	1	11	18	19	18	5	30.00	229.00	16.90	1.660	4,366.63	4,366.63
Ozark Range Mining Co.	1	1	1	1	1	16	10	26	4	80.00	533.50	18.12	1.160	9,660.00	9,660.00
Price Mining Co.	18	7	7	3	10	30	32	58	90	25	80.00	1,351.00	16.33	14,861.00	16,861.00
Custom Concentrating works.											8,457.50	25.00	9.000	45,137.38	50,105.24
Brinker Lead & Zinc Co.											510.00	58.84	13.00	10,466.00	10,466.00
Wood, H. Mining Co. (crusher)											1,000.00		20.00	14,000.00	14,000.00
Shorton Crusher Co.													14.00		
Vance, J. F. (land).															

*Ore reported by Chatlers. †Men and machinery employed, but no ore sold.

MADISON COUNTY.

Mine LaMotte (pig lead).....	3	7	5	1	2	12	171	117	288	3,431.31	78.20	283,328.44	283,328.44	283,328.44
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MILLER COUNTY.

Miller County Mining & Smelting Co.....										14 80		80 00		725 00		725 00
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MONITEAU COUNTY.

Kansas & Missouri Improvement Co.....											3 00	7 00	45 00	23 00	135 00	161 00	296 00
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MORGAN COUNTY.

Crystal Mining Co.....	1	1									2	1	3				920 00
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NEWTON COUNTY.

Emilie Zinc Co.....	1	1															2,689 55
Fredonia Mining Co.....	8	5															1,368 00
Granby Mining & Smelting Co.....	83	25	2														123,561 00
Henderson, R. H.....																	2,501 00
Johnson mines.....	3																2,151 00
McClelland & Maupin.....	2																660 00
Modoc Mining Co.....																	275 00
Norton Lead & Mining Co.....																	864 00
Pedree City Mining Co.....	1	1	1														3,352 50
Potwin, C. A.....	1	2	1	1													1,368 00
Roaring Springs Mining Co.....	7	8	3	1													27,671 00
Harrison, Ben mine.....																	23,980 00
Ruby Lead & Zinc Co.....	1	4	3	2													455 00
Splitlog Mining Co.....	1	1	1														19,008 00
Spurgeon mine.....																	41 65
Wainwright Bros. & Newman.....	2	1	3	1													2,300 00
Seneca Lead & Zinc Co.....																	299 00
Totals.....	56	48	44	8	4	17	52	223	184	407	163	1,504	60	47	11	70,894	310,723

PERRY COUNTY.

Tucker & Co.....																	675 00
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Character, Tonnage and Value—Continued.

ST. FRANCOIS COUNTY.

Name of firm, person or company operating mines.	No. of shafts.....	Machinery in use.				Employees.			Total No. of tons mined.		A. v. value per ton at mine.		Amount received for year's total output.		Total amount received for the year's total output.....	
		Boilers....	Pumps....	Crushers....	Rolls.	Jigs.	Hand.		Miners...	Other employees	Total employees	Lead.....	Zinc.....	Lead.....		Zinc.....
							Steam									
Doe Run Lead Co.....	1	4	6	3	4	12			74	91	165	40	2730 00	80 35	217600 00	217 600 00
St. Joseph Lead Co.....	8	35	18	10	10	112			286	330	616		13817 50	78 25	1094361 00	1 094 361 00
Totals.....	4	39	24	13	14	124			360	471	881	40	16537 50	79 83	1311961 00	1 311 961 00

WASHINGTON COUNTY.

Name of firm, person or company operating mines.	No. of shafts.....	Machinery in use.				Employees.			Total No. of tons mined.		A. v. value per ton at mine.		Amount received for year's total output.		Total amount received for the year's total output.....
		Boilers....	Pumps....	Crushers....	Rolls.....	Jigs.	Hand.	Miners...	Total employees	Other employees	Lead.....	Zinc.....	Lead.....	Zinc.....	
							Steam								
Abbyville Mining Co.....	1	1						2	8	6			49 00	1,360 00	1,360 00
Buggs, J. R. and R. M. (smelter)									8	8			49 25	16,691 09	16,691 09
Flynn, J. and M. M.....									8	8			48 69	4,053 04	4,053 04
Higgenbotham, J. T.....									2	2			48 00	3,700 40	3,700 40
Long, James (furnace)									3	3			45 00	9,000 00	9,000 00
Long, Wm. (furnace)									2	2					
Moran, Charles (furnace)									50	41	69 00		48 00	3,312 00	3,312 00
Palmer Lead Co.....	7	1							91	8	517 00		48 00	24,816 00	24,816 00
Shibboleth Lead & Mining Co.									3	3	215 00		48 00	10,320 00	10,320 00
Union Mining & S.....									4	4	211 00		48 00	10,128 00	10,128 00
White, Mrs. L. J.....									3	3	100 00		48 00	4,800 00	4,800 00
Totals	7	2	2					62	67	119	1,860 35		47 60	88,180 53	88,180 53

Table showing the Number of Men Employed, their Wages, and Kind of Machinery in use by Operators and Sub-operators of Lead and Zinc Mines, for year ending June 30, 1891.

GREENE COUNTY,

Name of lessor or lessee.	Postoffice address.	Power.			Machinery in use.				Employees.			Average wages per day of employees.				
		Steam	Horse	Hand	Boilers	Pumps	Crushers	Rolls	Jigs	Hand	Steam	Total employees.	Other employees	Miners	Bosses	Engineers
Duncan, J. K. D.	Ash Grove															
Dunlap & Co.	"				1							2	2			
Easton, J. A. & Co.	Mumford		1	1	1	1					2	10	8	18	\$2 00	\$1 50
Goetz & Co.	Ash Grove													4		
Gumbo Mining Co.	Mumford	2			3	2	1				5	12	18	30	2 50	2 00
James River Mining Co.	Springfield	1			1	1										
Murray & North -	Ash Grove			1								2	2	4		
Clinton Mining Co.	"			1								2	1	3		
Hutchings & Co.	"			1								1	2	4		
Murray & Russell	"			1								2	3	7		
Golden Eagle	"			1											1 50	1 10
Nixon & Holmes	Averton (Dade Co)															
Pennsylvania Mining Co.	Ash Grove												8	8		

JASPER COUNTY.

Acme Mining Co.	Joplin	100			1	1						2	3	6		
Ashcraft, Reynolds & Co.	Webb City	150			2	3						2	10	4	14	
Barbee & Co.	Joplin	85														
Blannerhasset	Zincte	85	1		1	2						5	7	9	16	2 00
															2 50	1 75

Employees, Wages and Kind of Machinery—Continued.

JASPER COUNTY—Continued.

Name of lessor or lessee.	Postoffice address.	Depth of shaft in feet	Power.			Machinery in use.				Employees.			Average wages per day of employees.				
			Steam	Horse	Hand	Boilers	Pumps	Crushers	Rolls	Jigs.	Hand	Steam	Miners	Engineers	Miners	Jig hands	Laborers
Burch Mining Co.	Scotland	137	1			1	2	1	1	1	1		6	2 25	2 00	2 75	1 75
Downing, W. G.	Joplin	137	1			2	1				3		6	2 00	2 00	2 00	1 75
Speed Bros.	Joplin	110				1							6				
Byers, Murphy & Connor	Joplin	85				4	10	1		4			14				
Center Creek Mining Co.	Webb City	135		1		1		1		1			8	2 50	1 75	2 50	1 75
Allen, D. C.	"	135	1			1		1		1			6	2 50	1 75	2 50	1 75
Beasley, G. W. & Co.	"	135	1			1		1		1			6	2 50	2 00	2 50	1 75
Bradley & Co.	"	143	1			1		1		1			9	2 50	2 00	2 50	1 75
Columbo & Garrison	"	135	1			1		1		1			2				
Carson, F. M.	"	135	1			1		1		1			2				
Davis & Co.	"	130	1			1		1		1			6	2 50	1 75	2 50	2 00
Ford, Owens & Co.	"	125	1			1		1		1			5				
Greenfield & Co.	"	125	1			1		1		1			4	2 50	2 00	2 50	1 75
Hutton, D. D.	"	170	1			1		1		1			10	2 00	2 00	2 00	1 75
Hood & Fyle	"	125	1			1		1		1			4	2 00	2 00	2 00	1 75
Martin & Co.	"	140	1			1		1		2			5	2 25	1 75	2 25	1 75
Marx, Ball & Co.	"	140	1			1		1		2			5	2 50	1 75	2 50	2 00
Page, D. M.	Joplin	140	1			1		1		2			4	2 00	2 00	2 00	1 75
Page & Co.	"	135	1			1		1		1			4	2 00	2 00	2 00	1 75
Paul & Co.	Webb City	135	1			1		1		1			7	2 50	1 75	2 50	1 65
Perkins & Co.	Carthage	140	1			1		1		1			5	2 50	1 75	2 50	1 65
Simmons & Co.	Webb City	135	1			1		1		1			4				
Snodgrass & Co.	"	135	1			1		1		1			4				
Verners Co.	"	160	3	2									23				
Quick Work	"	160											35				
Consolidated Mining Co.	Joplin	75	1			2	6				6		4				
Coschocton Mining Co.	Carthage	145	1			1	1	1		1							
Cottonwood Mining Co.	Joplin	60	1			2	2	1	1		6		7	2 50	1 75	2 00	1 75

[illegible]

Employes, Wages and Kind of Machinery

JASPER COUNTY—Continued.

Name.	Postoffice address.	Depth of shaft.	Power.			Machinery.					Employees.		Average wages.				
			Steam.	Horse.	Hand.	Boilers.	Pumps.	Crushers.	Rolls.	Jigs.	Miners.	Other employees.	Booses.	Engineers.	Miners.	Jig hands.	Laborers.
Empire Zinc Co. (Koh-i-noor Mine)	Joplin	140	1			2	3	1	4		14	25					
John Ferguson	Joplin	50	1									1					
Higgins & Co.	"	60	1	1						3	5	3			1.75	1.75	1.75
Lewis & Co.	"	50	1	1							3	1			1.75	1.75	1.75
Oviatte Brothers & Fish	"	50	1			3	1	1	2		10	10	4.00	3.00	1.75	2.25	1.50
Franklin Zinc Co.	Lehigh	90	1			4	7			7	9	9					
Cherry Tree Mine	Carl Junction	70	1	1		2	2	1		2	5	2		2.00	1.75	1.75	1.75
St. Louis Lead and Zinc Co.	"	60	1			1	1	1	1	1	6	13	2.50	3.00	1.75	3.00	1.75
White Elephant	Lehigh	Strip	1								10	7	2.50		2.00	3.00	
Garrison Lead & Zinc Co.	Webb City	165	1			5	5	1		4	4	6	2.50	2.00	2.00	2.00	1.75
Caldwell, S. H. & Co.	"	185	1								16	32	2.50	2.00	1.85	2.00	1.75
Horton & Co.	"	170	1	1		1	1			6	18	10	2.50	2.00	1.75	2.00	1.75
Irwin Campbell & Co.	"	160	1								7	5	3.00	2.00	2.00	2.00	1.75
Wilson & Sons	"	135				1	1		1								
Granby Mining and Smelting Co.	Oronogo	65	1				1				3	2			1.75	2.00	1.75
Allen, R. & Co.	"	55	1	1						2	5	5	1.75		1.75	2.00	1.75
Bodley & Co.	"	55	1	1						5	3	6	2.00		1.75	2.00	1.75
Dryden & Co.	"	55								4	3	4			1.75	2.00	
Demis & Co.	"	87		1						2	2	4	2.00		1.75	2.00	1.50
Keith & Co.	"	80		1						2	3	2		2.00	1.75	2.00	
Myers Mining Co.	Carthage	80	1			2	2	1		6	2	2			1.75		
Oronogo Union Mining Co.	"	140	1			2	2	1			3	3	2.00		1.75	2.00	
Sunshine mines.	Oronogo	30		1						2	3	4	2.00		1.75	2.00	
Wood & Co.	"	75		1		1				2	4	4	2.00		1.75		
Great Western Mining Co.	Joplin	100	1				1	1									
Johnson & Co.	"	97	1			1	1	1		2	3	6	2.50	2.25	1.75	2.25	1.75
Proudfoot, Mrs. M. C.	"	86	1				2				3	5	2.50	2.00	1.75	2.00	1.50

Granby Mining and Smelting Co.																	
Baker, A. & Co.		Joplin.	83	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Blue Rubber Mining Co.		"	66	1	1	1	1	1	1	1	1	1	1	1	1	2 13½	1 75
Gansley Mining Co.		"	80	1	1	1	1	1	1	1	1	1	1	1	1	1 90	1 75
Jackson, F. & Co.		"	98	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Johnson & Co.		"	70	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 25
Kansas City Mining Co.		"	96	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Loynes & Co.		"	70	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
McClellan & Co., D. C.		"	80	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
McClanahan & Co.		"	90	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Phillips & Co.		"	75	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Randall & Co.		"	110	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Swensburg, L. A. & Co.		"	60	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Gretchen Lead and Zinc Mining Co.		Joplin.	120	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Gulnn & Loyd.		Joplin.	188	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Huffman & Co.		"	159	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Loyd & Co.		"	159	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Loyd & Livingston		"	185	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Loyd & Logan		"	185	1	1	1	1	1	1	1	1	1	1	1	1	1 75	1 75
Hoff Land and Mining Co.		Joplin.	70	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
Home Mining Co.		Joplin.	70	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 60
A. W. Hough (town lots)		Carthage.	109	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 50
Houghton & Son.		Webb City	130	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 50
Jasper County Mining Co.		Carthage.	184	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 50
Jasper Mining Co.																	
Johnson & Copley (Brooks land)		Zincite	115	1	1	1	1	1	1	1	1	1	1	1	1	2 50	1 75
Knoble, A. M. (formerly owned by Holden)		Zincite	100	2	2	2	2	2	2	2	2	2	2	2	2	2 50	1 75
Frisco mine		"	110	2	1	1	1	1	1	1	1	1	1	1	1	2 50	1 75
Morning Star		"	117	2	1	1	1	1	1	1	1	1	1	1	1	2 50	1 75
W. M. Leckie.		Joplin	95	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
J. F. Lewis		Webb City	150	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Magnet Mining Co.		Carthage	126	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Martin Clotts & Co.		Joplin		1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Mefford & Young.		Joplin	90	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Mineral Creek Land & Mining Co.		Kansas City, Mo.	130	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Big 4 Mining Co.		Joplin	120	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Missouri Zinc Co.		Joplin	166	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75
Monard City Mining Co.		Webb City	70	1	1	1	1	1	1	1	1	1	1	1	1	2 00	1 75

Employees, Wages and Kind of Machinery—Continued.

JASPER COUNTY—Continued.

Name of lessor or lessee.	Postoffice address.	Depth of shaft in feet	Power.			Machinery in use.						Employees.		Average wages per day of employees.					
			Steam.....	Horse	Hand	Boilers	Pumps	Crushers	Rolls	Jigs.	Hand	Miners	Other employees	Booses	Engineers	Miners	Jig hands	Laborers	
Motley Mining Co.	Webb City	160	1	1		2	3	2		5		20	24			1 75	1 75	1 75	
Grubb & Stamp	Cartersville	160										3	4						
Murphy Land	Joplin											3	6						
Dancy mine	Zincite	74	1			2	2	1		2		3	3		1 75	1 75	2 00	1 50	
Gold Button	"	57	1									3	2		2 00	2 00	2 00	1 50	
Horne State	"	80	1									3	9		2 00	1 75	2 00	1 75	
Shirley & Co	"	78	1									3	4		2 00	1 75	2 00	1 50	
Meyers & Jennison	Carthage	140	1			1	2	1		1		8	7			1 85	2 50	1 25	
McCoy, J. P., Mining Co	Joplin	75	1			1	1					2	6						
Bremer Bros. & Co.	"	52	1			1	1					5	8		1 75	1 75	2 00	1 50	
Nichols & Co.	"	50	1			1	1					2	1			1 75	1 75		
Napier & Stum	Blenderville	60	1			1						3	2						
New York Land & Mining Co	Joplin	25	1			1	2					1	1				1 75		
B. F. Bailey & Co	"	25										1	3						
Nevada Mining Co.	Webb City	127	1			1	1					14	7		2 50	1 75	2 50	1 75	
Union Mining Co	"	80	1			1	1					6	6		2 50	1 75	2 50	1 75	
Vantelt & Co	"	103	1			1	1					14	6						
Nobel Mining Co	Webb City	166	1			1	2	1		1		14	6						
North Cartersville Mining Co., (N. Cartersville)—																			
Tower, Davey & Co.	Cartersville	105	1			1						2	3			2 00	2 00	1 75	
Buell & Co	"	60										2	7		2 50	1 75	2 50	1 75	
Davidson & Co	Joplin	160	1			1						1	2			1 75	1 75	1 75	
Jessup & Co	Webb City	110	1									3	4			2 00	2 00	2 00	
Moss & Co	Cartersville	114	1									3	4		2 50	2 00	2 00	1 00	
Williams & Co	"	100	1									2	2			2 00	2 00	2 00	
Wren, A. L.	"	60	1									2	2			1 75	2 00	2 00	

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Employees, Wages and Kind of Machinery—Continued.

JASPER COUNTY—Continued.

Name.	Postoffice address.	Depth of shaft	Power.			Machinery.				Employees.			Average wages.				
			Steam	Horse	Hand	Bollers	Pumps	Crushers	Rolls	Steam	Jigs.	Hand	Bosses	Engineers	Miners	Jlg hands	Laborers
Roaring Springs L. & M. Co.	Joplin	70	1			1	1					3					
Inter-State Mining Co.	Joplin	85	1			1	6					8					
Harris Bros	"	90		1								2				1 75	
Richard, W.	"	93		1								1				1 75	
Rose, C. E.	"	95		1								2				1 75	1 75
Task & Co.	"	95		1								2				1 75	1 75
Tanness & Co.	"	95		1								1				1 75	1 75
Wilmoth & Co.	"	100	1									1				1 75	1 75
Sargent, Jno. B.	Joplin	75	1			1	1					1					
Snyder Bros	Joplin	80	1			4	1	2		2		3					
Star Mining Co.	Joplin	80	1			1	1					6				2 00	
Spring, Moore & Davis.	Joplin	108	1			1	1					2					
South Cartersville Draining Co.	Cartersville	140	1			6		1				3				3 00	
Brasley & Co.	"	145	1									5				2 50	1 75
Oustatt & Co.	"	150	1				1	1		1		6				2 50	1 50
Poundstone & Co.	"	160	1				1	1				5				2 50	
South Joplin Lead and Zinc Co.	Joplin	145	1			2	2	1		2		5					
Standard Lead and Zinc Mining Co.	Joplin	145	1									1					
Standard Lead and Zinc Mining Co.	Joplin	148	1			2	2	1		2		6				3 00	1 75
Geoseberry mine	Zindke	131	1									3				2 00	2 00
Leitchner, Wilson & Co.	"	135	1			1	1	1		2		8				1 75	1 75
Steelman, A. T.	Webb City	150	1									6					
Steyling Lead and Zinc Co. (see other page)																	

Swarland Mining Co.	Joplin.	87%	1	3	6	2					8	5	8	1.75	1.75	1.75
Moore Ore Co.	"	87	1									4	9	1.75	1.75	1.75
Turkey Creek Mining Co.	"	88										4	9	1.75	1.75	1.75
Whitsett & Co.	"	88	1									4	9	1.75	1.75	1.75
Theaker Mining & Smelting Co.	Joplin.	61	1	1	9	1	1				9	9	9	2.00	2.00	2.00
Gooden Bros.	"	75									9	9	9	2.00	2.00	2.00
Good Co.	"	75									9	9	9	2.00	2.00	2.00
Jordan & Co.	"	95									9	9	9	2.00	2.00	2.00
Kirkald & Co.	"	85									9	9	9	2.00	2.00	2.00
Kirkald & Co.	"	85									9	9	9	2.00	2.00	2.00
Mehrs & Co.	"	80									9	9	9	2.00	2.00	2.00
McKinney & Co.	"	80									9	9	9	2.00	2.00	2.00
Tracy Lead and Zinc Mining Co.	Webb City	184	1	18	11						7	7	7	2.00	2.00	2.00
Bare, Joe & Co.	Cartersville	128									7	7	7	2.00	2.00	2.00
Blanton & Co.	Webb City	160	1								7	7	7	2.00	2.00	2.00
Clark & Jule	"	100									7	7	7	2.00	2.00	2.00
Davis & Co.	"	100									7	7	7	2.00	2.00	2.00
Delph & Co.	"	100									7	7	7	2.00	2.00	2.00
Hampton & Co.	"	150									7	7	7	2.00	2.00	2.00
Horton & Co.	"	160									7	7	7	2.00	2.00	2.00
Indianapolis Mining Co.	Cartersville	160	1								7	7	7	2.00	2.00	2.00
Lecky Wm.	Joplin.	165	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Lichter & Page	"	160									9	9	9	2.00	2.00	2.00
Logan & Delph	Webb City	185	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Martin & Co.	"	185	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
McConey & Co.	Joplin.	160	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Parker Bros.	Webb City	185									9	9	9	2.00	2.00	2.00
Reed, Cap.	"	160	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Smith & Tracey	"	160									9	9	9	2.00	2.00	2.00
Sullivan & Co.	Cartersville	115	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Star Mining Co.	Joplin.	200	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Swasey & Co.	Cartersville	175	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Tracey & Co.	Webb City	160	1	1	1	1	1	1	1	1	9	9	9	2.00	2.00	2.00
Jasper Mining Co., (H. Toucher).	Joplin.	63	1	2	4	1	1	1	1	1	3	5	9	\$1.75	\$1.75	1.75
Collings & Peterson	"	60	1	2	1	1	1	1	1	1	3	5	9	1.75	1.75	1.75
Cunningham, W. W.	"	60	1	2	1	1	1	1	1	1	3	5	9	1.75	1.75	1.75
Orr & Co.	"	70	1	1	0	1	1	1	1	1	4	10	16	2.00	2.00	2.00
Warren Bros.	"	50	1	1	1	1	1	1	1	1	4	3	5	2.00	2.00	2.00
Troup Mining Co.	Cartersville	175%	1	4	3	1	1	1	1	1	21	18	39	2.00	2.00	2.00
Brent, Post & Co.	"	180	1	1	1	1	1	1	1	1	2	3	6	2.00	2.00	2.00
Dalsey Mining Co.	"	170	1	1	1	1	1	1	1	1	3	8	14	2.00	2.00	2.00
Manley & Co.	"	172	1	1	1	1	1	1	1	1	7	6	13	2.00	2.00	2.00
Mespley & Co.	"	170	1	1	1	1	1	1	1	1	6	5	11	2.00	2.00	2.00
Nelson & Sealey	"	170	1	1	1	1	1	1	1	1	4	2	4	2.00	2.00	2.00
Lamar Co.	"	169	1	1	1	1	1	1	1	1	2	6	12	2.00	2.00	2.00
Tuckahoe Mining Co.	Joplin.	70									2	6	6	1.75	1.75	1.75
Buckert & Co.	"	90	1	1							3	4	5	1.75	1.75	1.75
Donnan & Co., A. F.	"	110	1								2	3	4	1.75	1.75	1.75
Fenix & Co.	"	117									6	6	7	1.75	1.75	1.75
Gerard & Co.	"	185	1	1	1	1	1	1	1	1	6	6	7	1.75	1.75	1.75

Employees, Wages and Kind of Machinery—Continued.

JASPER COUNTY—Continued.

Name of lessor or lessee.	Postoffice address.	Depth of shaft in feet	Power.			Machinery in use.					Employees.		Average wages per day of employees.					
			Steam	Horse	Hand	Boilers	Pumps	Crushers	Rolls	Jigs.	Hand	Other employees						
										Steam		Miners	Bosses	Engineers	Miners	Jig hands	Laborers	
Turkey Creek Mining Co.	Joplin	80	1			1	5			2		5	2 50	2 00	1 75	2 50	1 50	
Astor Mining Co.	"	110	1			1	1	2		4		14	2 50	2 00	1 75	2 00	1 75	
Buckhorn Mining Co.	"	100	1			2	1	1				8	2 50	2 00	1 75	2 00	2 00	
Holmes & Co. (or Hames).	"	90		1							3	5	2 00	1 75	2 00	2 50	1 75	
Queen Bee Mining Co.	"	100	1			1		1		1		5	2 50	1 75	1 75	2 50	1 50	
Sunflower Mining Co.	"	100	1			2	2	1				5	2 50	2 50	1 75	2 50	1 50	
Taylor, Lee.	"	90	1			1		1			3	6	2 00		1 75	1 75	1 75	
Victor Mining Co.	Joplin.	175	1			2	4	2		2		30						
West Hollow L. & Z. Co.	Joplin.	110	1									8	2 25	2 75	1 75	2 25	1 75	
West Hollow L. & Z. Co.	"	120	1			3	8	1		1		2				1 75	1 75	
Allen & Co.	Zincite	87		1							2	2		2 00	2 00	2 50	1 75	
Copley, J.	"	105	1			2	3	1		2		18	3 00		1 75			
Huff & Co.	"	100		1								2						
Kemp & Co.	"	94		1							3	2				1 75		
Williams Crushing Works	Joplin.					1	1	1				4						
Winsor Mining Co.	Kansas City Mo.																	
Hanover Mining Co.	Joplin.	120	1			1	1	1		1		4	2 00	2 00	1 75	2 50	1 75	
Hubbard & Co.	"	120	1			1	1	1				6	2 50	2 50	1 75	2 00	1 50	
Myrtle Mining Co.	"	120	1			1	1	1				4	2 50	2 00	1 75	2 00	1 50	
Sellers & Co.	"	90	1			1	1	3		8		7	2 00	1 75	1 75	1 75	1 50	
Tenderfoot Mining Co.	"	110		1			1				2	3	2 50		1 75	1 75	1 50	
Zinc Hill Mining Co.		125	1			3	2				7	8						

LAWRENCE COUNTY.

[illegible]

Employees, Wages and Kind of Machinery—Continued.

LAWRENCE COUNTY—Continued.

Name.	Postoffice address.	Power.				Machinery.				Employees.			Average wages.				
		Steam	Horse	Hand	Boilers	Pumps	Crushers	Rolls.	Jigs.	Hand	Other employees	Total employees	Bosses	Engineers	Miners	Jig hands	Laborers
T. J. Lisle's Land.	Aurora.	1			2	1						12		1 75	2 00	1 75	1 50
Contact Mine	"	1			1	1						8					1 25
Lindsley, H. C.	"	1			1	1						1		2 25	1 37½	3 00	1 50
Lindsley, H. C. & Co.	"	1			1	1						4			1 75	1 50	1 25
Mansing & Son	"								1			2			1 50	1 50	
Louisville Zinc and Lead Mining and Smelting Co.	Aurora.				1							6			1 65		1 50
Abrahams & Co.	"					2						9			1 75		1 75
Coats & Co., Wm.	"											13			1 65		1 50
Gibson, Mollie & Co.	"											3			1 65		1 50
Hopper & Co.	"											7			1 60		1 25
Hopper & Co.	"											6		2 00	1 50		
Rose & Co.	"	1			1							9		2 00	1 50		
Midland Mining Co. —	Aurora.											3			1 25		1 75
Murry & Byers.	"											1					
Missouri Mining Co. —	Aurora.											4			1 75		1 50
Alexander Mining Co.	"											7			1 85		1 50
France & Seburn.	"											5			1 50		1 25
Ingraham, H.	"											3			1 50		1 25
Johnston & Co.	"											2			1 75		1 75
Shawmut Mining Co.	"											3			1 50		1 25
Sweet Home Mining Co.	"											3			1 50		1 25
Tindall & Davis.	"											2			1 50		1 25
Wright & Co.	"											2			1 50		1 00
New York Land Mining Co.	Aurora.				1	2						3			1 75		
Baltimore Mining Co.	"											1			1 75		2 00
Hickman & Anderson	"					1						3		3 00	1 85	1 75	1 50
Empire Co.	"											1			1 75		1 50
Kuby & Co.	"											3			1 50		1 25
Ozark Range Mining Co.	Aurora.					1						6			1 50		1 50
Hays City Mining Co.	"					1						5		2 00	2 00	2 00	

"	Lackawanna Mining Co	100	1	1	1	1	3	4	8	7	2.00	1.75	1.75	1.75	1.25
"	Shamrock Mining Co	70	1	1	1	1	6	6	2	8	1.75	1.75	1.75	1.75	1.25
Aurora	Custom Concentrating Works						10		15	15			1.75	1.75	
Aurora	Brinker Lead & Zinc Co.						6								
"	Bannister & Co.	40	1				2	2	6	2	1.75	1.75	1.75	1.75	1.75
"	Hartins & Co.	45	1				2	2	6	2	1.75	1.75	1.75	1.75	1.75
"	Herron & Charles	106					1	2	4	7	2.00	1.65	1.65	1.65	1.50
"	James & Co.	70	1				1	3	4	6	10				1.50
"	Jernagan & Co.	40		1											
"	Last Chance	65	1				2	2	1	4	2	1.75	1.75	1.75	1.75
"	Rains & Co.	80	1				1								1.75
"	Ritter & Co.	40	1				1	2	1	3		1.60	1.60	1.60	1.60
"	Thomas, Henry	50						2	1	3		1.75	1.75	1.75	1.75
"	Spahn, Lowery & Co.	80	1				1	1			2.00	1.60	1.60	1.60	1.60
"	Sargent & Co.	50						2	1	3		1.75	1.75	1.75	1.75
"	Shorten & Co.	100	1				1	2	1	10		2.00	2.00	2.00	1.95
"	Harry Wood Mining Co	110	1				2	5	5	10		1.60	1.60	1.60	1.60
"	Shorten Crusher Co		1					12	12	12		1.75	1.75	1.75	1.25
Aurora	J. T. Vance land														
"	Goodman & Co.	80	1				2	2	5	7	1.75	1.75	1.75	1.75	1.50
"	Griffey & Co.	85	1				2	2	5	6	11	2.00	2.00	2.00	1.50
"	Nathan & Co.	80	1				4	4	4	7	11	2.00	2.00	2.00	1.50
"	Oliver & Co.	75	1				2	2	3	3	6	2.00	1.75	1.75	1.75
"	Reynolds & Co.	65	1				4	4	4	5	9	2.25	1.50	1.75	1.50
"	Tindle & Co.	85	1				1	1	1	1	2	2.00	2.00	2.00	1.25
"	Wilson, Lay & Co	90	1				1	1	1	4	8	2.25	1.25	1.75	1.50

NEWTON COUNTY.

	120	1		1	1		3	10	8	18				
Emilie Zinc Co.	Joplin	120	1		1	1								
Fredonia Mining Co.	Joplin	40	1		2	3			1	1				
Kingman Mining Co.	Saginaw	40		1			1	2	3	5			1 75	1 75
Macenzie & Co.	"	33					1	1	1	2			1 75	1 75
Sigler Mining Co.	"	45	1		1		1	4	4	2	00	1 75	1 75	1 50
Granby Mining & Smelting Co.	Granby	76		1					44	44				
Adkins & Co.	"	76	1				2	10						
Alcohol	"	80	1		1	1			3	2	5		1 50	1 25
Blank & Co.	"	87	1						1	4	8	7	1 50	1 50
Blow-up	"	105	1		2	2			4	2	6		1 50	1 25
Beaver & Co.	"	70							5	8	8		1 75	
Butler, Ben.	"	90	1	1	1				2	1	3			
Cadmiun	"	55					1	4	3	7			1 50	1 50
Chester & Co.	"	60		1	1	1		4	1	5	4		1 50	1 50
Club & Chester.	"	58		1	1	1		2	2	2	1		1 50	1 25
Combination	"	95	1	1	1	1		4	1	3	6		1 75	1 50

WASHINGTON COUNTY.

Palmer Lead Co.	Palmer	127	1	1	1	1	1	1	1	10	10	20					
Bellfield	..	127	1	1	1	1	1	1	1	4	1	5	..	..	..	..	..
Donnard	..	96	1	1	1	1	1	1	1	2	1	3	..	..	..	..	..
Hawkins No. 1.	..	108	1	1	1	1	1	1	1	10	3	18	..	..	..	..	..
Hawkins No. 2.	..	132	1	1	1	1	1	1	1	12	3	16	..	..	..	..	..
Robinson	..	122	1	1	1	1	1	1	1	6	1	6	..	..	..	..	..
Shepherd	..	130	1	1	1	1	1	1	1	3	1	4	..	..	..	..	..
Thomas	..	136	1	1	1	1	1	1	1	4	1	5	..	..	..	..	..

TABLE X.—Comparative table of output of Lead and Zinc mines for 1889, 1890 and 1891.

Name of county.	Number of tons mined.						Total value of output of lead and zinc for 1891.....
	Lead.			Zinc.			
	1889.	1890.	1891.	1889.	1890.	1891.	
Barry.....				180.0		575.00	\$9,775 00
Christian.....		80.0	20 00		100 0	40.00	1,760 00
Cole.....			46.00				2,024 00
Dade.....	55.0		87.50	174.0	1,647.8	1,278.60	17,946 70
Franklin.....			231.00				10,164 00
Greene.....	70.5	840.6	200.10	628 0	552.9	1,071.10	50,425 65
Jasper.....	5,330.2	7,159.8	7,994.00	59,162.0	74,141.4	96,576 00	2,611,724 50
Jefferson.....	309.0	277.0	497.00	3,055.0	2,614.0	2,116.00	53,236 00
Lawrence.....	1,231.8	2,873.4	4,461.61	18,027.5	12,877.1	15,552.62	465,697 30
Madison.....	*3,715.0	*3,082.6	*3,431.81				268,323 44
Miller.....			14.50				725 00
Moniteau.....		12.0	3.00			7 00	296 00
Morgon.....		4.5		15.5		40 00	920 00
Newton.....	1,863.8	1,757.5	1,504.60	6,990.2	8,285.4	7,900 70	210,723 70
Perry.....			15.00				675 00
St. Francois.....	*19,484.7	*16,900 0	*16,537.50				1,311,961 00
Washington.....	560.0	454.4					
Washington.....	*2,260 5	*518.8	1,850.25	125 0			88,180 53
Totals.....	9,469.8	12,909.2	16,925.19	82,857.2	100,249.1	123,752.00	
*Pig lead.....	*25,440.2	*20,451.4	*19,968.81				5,084,462.82

ACCIDENTS IN LEAD AND ZINC MINES.

During the past year there have been 35 accidents reported to this office from the lead and zinc mines, twelve of which proved fatal, as compared with 13 for the preceding year. Three of these fatal accidents occurred by falling roof, one by falling timber, one by falling scaffold, two by premature discharge of shots, two by the rope becoming detached from the tub while ascending out of the shaft, two by machinery, and one by foul air.

The mine operators have reason to congratulate themselves over the comparatively few fatal accidents as compared with the report of 1890, when it is considered that the value of the output has shown an increase of more than \$728,000 over 1890, with one life less lost.

TABLE XI—Showing Accidents in Lead and Zinc Mines, by Counties.

Name of employer.	Name of employee.	Occupation.	Amount of insurance.						Nature of accident.	Coroner's verdict.
			Was employee insured?.....	No. Yes.	Non-fatal.....	Fatal.....	No. of children.....	Single.....		
			Married.....							
			Age.....							
<i>Barry county.</i>										
Allen, Stark & Co	Henry Cratzer.....	Miner.....	18	1	1		1		Killed by gases from dynamite.....	
<i>Dade county.</i>										
John Hennessy.....	John Hennessy.....	Miner.....	18	1	1		1		Killed by falling ore.....	Killed by ore falling.
<i>Greene county.</i>										
Nixon & Murray	Thos. Richardson.....	Miner.....	18	1	1		1		Arm broke by falling rock.....	
<i>Jasper county.</i>										
White Elephant Zinc Co	L. Stanlaker.....	Miner.....	18	1	1		1		Killed by falling rock.....	
Oasis Lead & Zinc Co	J. A. Campbell.....	".....	25	1	1		1		Hurt in leg by falling rock.....	
Wm. Thompson.....	Mac Turner.....	".....	19	1	1		1		Shoulder dislocated by falling rock.....	
Oronogo Union Mining Co	Neat Wagnor.....	".....	24	1	1		1		Ankle sprained; bucket fell.....	
Lichter & Co.....	Mont. Gibson.....	".....	28	1	1		1		Slightly injured; bucket fell.....	
Phinney, Dolark & Co	David Gibson.....	".....	45	1	1		1		Fell 140 feet; hoister defective.....	
Snyder Bro's	M. M. Thompson.....	".....	32	1	1		1		Hoister ran away.....	
Porter Mining Co.....	Joseph Park.....	Steamfitter man.....	31	1	1		1		Killed; foot caught in belt.....	
	Frank Miller.....	Ground f man.....	28	1	1		1		Rope broke; fell 60 feet; ankle dislocated.....	
Zenter, Leakey & Lutz	John Varnay.....	Miner.....	37	1	1		1		Premature explo.; arm and hip injured.....	
Empire Zinc Co	Nothen Adlis.....	Laborer.....	30	1	1		1		Falling rock.....	
Peth Mining Co	Wm. Palmer.....	Ground f man.....	33	1	1		1		Foot footing in climbing curbing.....	
Pacific Mining Co	Thos. Cronch.....	Miner.....	29	1	1		1		Shot exploded; eyes injured.....	
W. S. Poundstone & Sons	C. M. Harland.....	".....	23	1	1		1		Fell into master wheel.....	
W. S. Poundstone & Sons	Chas. Russell.....	".....	22	1	1		1		Fell by falling roof.....	
Meyers & Jenkinson	Al Chancy.....	".....	49	1	1		1		Fell in shaft; broke ankle.....	
Morning Star Mining Co	Lewis Davis.....	".....	19	1	1		1		Killed; hook to tub gave way while ascending.....	
Morning Star Mining Co	Thos. Hughes.....	".....	28	1	1		1		Killed; hook to tub gave way while ascending.....	

[illegible]

LIST OF LEAD AND ZINC OPERATORS IN MISSOURI

That were operating mines during past year, with location and postoffice address.

Name of mine operator or company.	Postoffice.	Mine located near
BARRY.		
Drake Mining Co.....	Purdy.....	Purdy.....
Kelley & Anderson	".....	".....
CHRISTIAN.		
Reported by David Wolff.....	Ozark.....	.....
COLE.		
Wentworth, J. D.	Enon.....	Enon
DADE.		
Alden & Hughes.....	Greenfield.....	.....
Coory Mining Co.....	".....	.....
Southwestern Mining Co.....	Everton.....	Everton
Thurman, J. W.	".....	".....
FRANKLIN.		
Bartle, J. H.....	St. Clair.....	St. Clair.....
GREENE.		
Duncan, J. K. P.....	Ash Grove.....	Ash Grove.....
Dunlap & Co.....	".....	".....
Katon, J. A. & Co.....	Mumford	Mumford.....
Goetz & Co.....	Ash Grove.....	Ash Grove
Gumbo Mining Co.....	Springfield.....	Mumford
James River Mining Co.....	".....	".....
Murray & North.....	Ash Grove.....	Ash Grove
Nixon & Holmes.....	Everton (Dade county).....	.....
Pensylvania Mining Co	Ash Grove.....	.....
JASPER.		
Acme Mining Co.....	Joplin	Joplin
Aschraft, Reynolds & Co.....	Webb City.....	Webb City.....
Barbee & Co.....	Joplin	Joplin
Burch Mining Co.....	".....	Scotland
Byers, Murphy & Conner	".....	Joplin.....
Center Creek Mining Co	Webb City	Webb City.....
Consolidated Mining Co.....	Joplin	Joplin
Coshocton Mining Co.....	Carthage	Carthage.....
Cottonwood Mining Co	Joplin	Zincite.....
Daugherty & Davy	Carterville.....	Carterville.....
Daugherty, Davy & Daugherty.....	".....	".....
Davidson, W. G.....	Joplin	Joplin.....
Diamond Lead & Zinc Co.....	.....	Blendville.....
Eleventh Hour Mining Co.....	Webb City.....	Webb City.....
Empire Zinc Co.....	Joplin	Joplin
Ferguson, John.....	.....	.....
Franklin Zinc Co	Lehigh	Lehigh.....
Garrison Lead & Zinc Co.....	Webb City.....	Webb City.....
Granby Mining & Smelting Co.....	Oronogo.....	Oronogo
Granby Mining & Smelting Co.....	Joplin.....	Joplin.....
Great Western Mining Co.....	".....	.....
Gretchen Lead & Zinc Mining Co....	".....	Joplin
Gulch Mining & Smelting Co.....	Lehigh.....	Lehigh.....

LIST OF LEAD AND ZINC OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
Guinn & Lloyd.....	Joplin.....	Joplin.....
Hoff Land Mining Co.....	".....	".....
Home Mining Co.....	".....	".....
Hough, A. W.....	Webb City.....	Webb City.....
Jasper County Mining Co.....	Carthage.....	Cartersville.....
Jasper Mining Co.....	Joplin.....	Joplin.....
Johnson & Copley.....	Zincite.....	Zincite.....
Knoble, A. M.....	".....	".....
Leckie, W. M.....	Joplin.....	Joplin.....
Lewis, J. F.....	Webb City.....	Webb City.....
Magnet Mining Co.....	Carthage.....	Carthage.....
Martin, Clotts & Co.....	Joplin.....	Carthage.....
Mefford & Young.....	".....	".....
Mineral Creek (Land & Mining Co).....	Kansas City.....	".....
Missouri Zinc Co.....	Joplin.....	Joplin.....
Motley Mining company.....	Cartersville.....	Cartersville.....
Murphy, Pat.....	Joplin.....	Zincite.....
Myers & Jennison.....	Carthage.....	Carthage.....
McCoy, J. P., Mining company.....	Joplin.....	Joplin.....
Napier & Stum.....	".....	".....
New York Land and Mining Co.....	".....	".....
Nevada Mining company.....	Webb City.....	Webb City.....
Noble Mining company.....	".....	".....
Tower, Davy & C.....	Cartersville.....	Cartersville.....
North Joplin Land company.....	Joplin.....	Joplin.....
Oswego Mining company.....	".....	".....
Ozark Mining company.....	".....	".....
Pacific Mining company.....	Carthage.....	Carthage.....
Pfennig & Co.....	Joplin.....	Joplin.....
Pleasant Valley Lead & Zinc Co.....	Carthage.....	Carthage.....
Porter, E. D. & Co.....	Joplin.....	".....
Reynolds, J. N.....	".....	".....
Rice & James.....	".....	Joplin.....
Roaring Sp'gs Lead and Zinc M. Co.....	".....	".....
Interstate Mining company.....	".....	".....
Sargent, John B.....	".....	".....
Smith & Moeller.....	".....	Cartersville.....
Snyder Bros.....	".....	Joplin.....
Spring, Moore & Davis.....	Webb City.....	Zincite.....
Davy, Tower & Co.....	".....	Cartersville.....
South Joplin Lead and Zinc Co.....	Joplin.....	Joplin.....
Standard Lead and Zinc Mining Co.....	".....	Zincite.....
Steelman, A. T.....	Webb City.....	Webb City.....
Sterling Lead and Zinc company.....	".....	Joplin.....
Swartzand Mining company.....	".....	".....
Thacker Mining and Smelting Co.....	Joplin.....	".....
The Alba Mining company.....	".....	Webb City.....
Tracy Lead and Zinc company.....	Webb City.....	".....
Troup Mining company.....	Cartersville.....	Cartersville.....
Tuckahoe Mining company.....	Joplin.....	Joplin.....
Turkey Creek Mining company.....	".....	".....
Victor Mining company.....	".....	Webb City.....
West Hollow Lead and Zinc M. Co.....	".....	Zincite.....
Williams Crushing Works.....	".....	Joplin.....
Winsor Mining company.....	Kansas City.....	".....
Zinc Hill Mining company.....	Joplin.....	".....
JEFFERSON.		
Valle Mining Co.....	Valle's Mines.....	Valle's Mine.....

LIST OF LEAD AND ZINC OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
LAWRENCE.		
Aurora Zinc Co.....	Aurora ..	Aurora
Brinkerhoff Mining Co.....	"	"
Berry, Frank.....	"	"
Blackland Mining Co	"	"
Brinkerhoff Mining Co.....	"	"
Dayton Mining Co	"	"
Decatur Lead and Zinc Co.....	"	"
Kentucky Mining Co.....	"	"
Lisles, T. J.....	"	"
Louisville L. and Z. M. and S. Co..	"	"
Midland Mining Co	"	"
Missouri Mining Co.....	"	"
New York L. and Mining Co.....	"	"
Ozark Range Mining Co	"	"
Price Mining Co.....	Peirce City.....	Peirce City
Reynolds, Howelton, Payne, Regan & Taylor.....	Aurora	Aurora
Rinkler Lead and Zinc Co.....	"	"
St. Louis & Aurora Mining Co	"	"
J. T. Vance Land Co.....	"	"
MADISON.		
Mine LaMotte	Mine LaMotte	Mine LaMotte
MILLER.		
Miller County M. and S. Co.....	Tuscumbia .....	.....
MONTEAU.		
Kansas & Missouri Improvement Co	Topeka, Kas .....	.....
MORGAN.		
Crystal Mining Co.....	Versailles	Versailles.....
NEWTON.		
Emille Zinc Co.....	Joplin (Jasper Co.)	Joplin
Fredonia Mining Co.....	"	"
Granby Mining & Smelting Co	Granby	Granby
Henderson, R. H.....	Pacific .....	.....
Johnson mines.....	Joplin (Jasper Co.) .....	.....
McClelland & Maupin.....	"	Joplin
Modoc Mining Co	"	"
Morton Land & Mining Co.....	"	"
Peirce City Mining Co.....	Wentworth	Wentworth.....
Potwin, C. A.....	Seneca	Seneca.....
Ruby Lead & Zinc.....	St. Louis and Joplin .....	.....
Splitlog Mining Co.....	Joplin	Saginaw
Spurgeon mine .....	" .....	.....
Roaring Springs.....	"	Joplin
Roaring Springs L. & M. Co	"	"
Wainwright Bros. & Newman	Pacific.....	.....
PERRY.		
Tucker & Co.....	Silver Lake.....	.....

LIST OF LEAD AND ZINC OPERATORS—Continued.

Name of mine operator or company.	Postoffice.	Mine located near
ST. FRANCOIS.		
Doe Run Lead Co	Doe Run	Doe Run
St. Joseph Lead C	Bonne Terre	Bonne Terre
WASHINGTON.		
Abbyville Mining & Smelting Co...	Sullivan (Franklin Co) .....	.....
Bugg, J. P. & R. M	Potosi	Potosi
Flynn, I. & M. M.	Richwood	Richwood
Higgenbotham, J. T	Fertile	Fertile
Long, Jas.	Potosi	Potosi
Long, Wm	"	"
Moran, Chas	Richwood	Richwood
Palmer Lead Co ..	Palmer	Palmer
Shibboleth L. & M. Co.	Cadet	Cadet
Union Manufacturing Co	Old Mine	Old Mine
White, Mrs. L. J	"	"

GLOSSARY

OF MINING TERMS USED IN MISSOURI LEAD AND ZINC MINES.

Bucking ore—Hand process of crushing.

Cotton rock—Decomposed chert.

Calcine furnace—A furnace for roasting the ore.

Concentrating plant—A complete plant for cleaning the ore, consisting of crushers, rolls and jigs.

Crusher—A machine used in crushing disseminated ores.

Dressing works—See concentrating plant.

Dry-bone—Carbonate of lead.

Flint—Chert rock.

Hoister—A machine with which to hoist the ore, etc. It may be a steam or horse hoister.

Jack—Zinc blende.

Jig—A machine to separate the ore from the waste.

Mineral—Galena or lead ore.

Mundic—Iron pyrites.

Opening—A fissure or cave.

Rolls—Machinery to reduce disseminated ores.

Scraper—One who separates the ores from the waste rock.

Silicate—Carbonate of zinc.

Squib—Small charge of powder exploded in the bottom of a drill-hole, to spring the rock, after which a heavy shot is fired.

Stoping—Mining out the ore.

Tiff—Calcite of lime.

Tub—Ore-bucket used in hoisting.

Whim—A horse hoister.

PART THIRD.

REPORT ON THE IRON INDUSTRY

FOR YEAR ENDING JUNE 30, 1891.

REPORT.

The iron ore output for the State during the past year, as reported by the ten mining companies or operators, was 138,356 tons, against 232,835 tons for the preceding year, showing a decrease of 94,479 tons, or about 40%. The depression is attributed to the small demand for ore, but notwithstanding the light sales, companies have in most instances continued operations with nearly a full force of men, and some of them have been stocking the product at the mines. The census report shows that on January 1, 1890, there were 291,700 tons of ore in stock at Missouri iron mines.

The principal mining operations are of the specular ores at the Iron Mountain mines in St. Francois county, and of the hematites of the Cherry Valley mine in Crawford county. These two mines produced about 77% of the State's entire output.

The old Pilot Knob mine, in Iron county, which has been heretofore one of the large producers, has done but little during the past year.

TABLE XII—Summary of general results of investigations in Iron Mines

For the year ending June 30, 1891, as compared with the year ending June 30, 1890.

	1890.	1891.	Increase over 1890.
Number counties reported producing iron....	5	6	1
Number of mines or openings reported.....	6	17	11
Total number tons ore produced.....	232,835	*138,356	.....
Average value per ton at mines.....	\$2 47	*\$2 39	.....
Total value of product at mines.....	\$575,995	*\$331,665 48	.....
Number of all employes.....	589	*448	.....
Number of miners employed.....	351	*257	.....
Number of other employes.....	238	*191	.....
Number men killed.....	1	.....	.....
Number wives made widows.....	1	.....	.....
Number children made fatherless.....	2	.....	.....

* Decrease.

The following is a description of the condition and location of the iron mines of the State :

CRAWFORD COUNTY.

Bower's mine—This mine is located at Wilson's Mill, on the Salem branch of the Frisco railroad. The mine has not been in operation for several months, on account of small demand for the ore. It is, when in operation, run by Mr. Wm. James, of St. James, Phelps county. Some ore was also produced by the "Swyers" mine during the past year, but only a small amount.

Meramec Iron Mining company—Capt. E. T. Herndon, general manager. Mine is located at Cherry Valley, 6 miles southeast of Midland blast furnace, and connected with the Salem branch of the Frisco railroad by a switch. The ore was found near the surface, and has been worked to a depth of about 110 feet. It extends over an area of nearly 5 acres. I am told that nearly 500,000 tons of ore have been produced by this mine. The ore is brought to the surface by machinery up an incline plane, after which it is hauled to tipple and dumped into railroad cars and shipped to market.

The plant gives employment to about 52 men, whose wages vary from \$1.10 to \$1.50 per day, company furnishing houses to married men free of rent.

DENT COUNTY.

Cassey, C. A. & John—Mine located about 6 miles west of Salem. But little ore produced during the past year.

Midland Blast Furnace company—Mr. B. B. Reagan, superintendent. Mine located at Condray, but office at Midland, Crawford county. Mine is connected with Salem branch of Frisco railroad by a switch. It is known as the "Hawkins" bank, and was opened in 1879, since which time about 83,000 tons of ore have been produced, but only about 38,000 tons have been shipped—the remainder is in stock at the mine. The ore was found cropping out on the surface, and has been worked by open cut to a depth of about 70 or 80 feet. However, a shaft has recently been sunk on the deposit just north of the cut through which the ore in this part of the mine is to be drawn.

There are about 40 men employed; wages from \$1 to \$1.25 per day.

Missouri Iron Co.—Mr. E. B. Sankey, superintendent. Mine located about 1 mile southwest of Salem, and is known as "Simmons

Mountain" bank. It is connected with the Salem branch of the Frisco railroad by a switch. The mine was opened in 1873, since which time it has been in operation, and had produced 236,000 tons of ore up to June 30, 1891, as stated by the superintendent.

The work done during the past year has been more in the nature of development, driving headings, etc., to show the extent of the deposit. The ore is brought to the surface through a slope by machinery. Mine was found in reasonably good and safe condition date of inspection (July 28). From 25 to 30 men are employed in and about the mine; wages of employes from \$1 to \$1.50.

Sligo Furnace Co.—E. L. Foote, vice-president and superintendent. Mine located at Eden, but company office is at Sligo. Mine is known as "Plank" bank; it is connected with the Salem branch of the Frisco railroad by a switch. The ore was found near the surface and was worked for several years by open cut; but a shaft has recently been sunk to a depth of 185 feet, through which the ore is now being hoisted. I visited and made a careful examination of the mine and plant July 28, and found that the cage had no safety catches on it, nor were there any gates around the shaft top. Mine wet and muddy, but drained as well as practicable. Mr. R. L. Kneedler, mine superintendent, was requested to have gates or protection of some kind put around the top of shaft and put safety catches on cage as soon as practicable. No ore has been shipped during the past year, but there are several car-loads in stock at the shaft.

The Craig mine is also operated by this company, but it has shipped no ore during the past year. These two mines give employment to from 30 to 40 men; wages from \$1 to \$1.50 per day.

IRON COUNTY.

St. Louis Ore and Steel company.—Mine located at Pilot Knob, with general office at St. Louis, Missouri. In July, 1890, the property went into the hands of a receiver, Mr. E. A. Hitchcock being appointed, and July 7th he appointed Mr. G. W. Craine superintendent, a gentleman who has been with the company for a number of years. The work is now confined to an open cut on the northeast side of the mountain and about two-thirds of its distance from the bottom, the ore being carried down the mountain in cars by an inclined plane to the railroad switch. The system of paying employes has been changed during the past year; they are now paid every two weeks in place of monthly, as heretofore. Wages are from \$1.25 to \$1.50 per day for ten hours' work.

About 40 men were employed at date of inspection (June 19th), the working force having been reduced during the past year.

PHELPS COUNTY.

James, Wm.—Mine located about $5\frac{1}{2}$ miles southeast of St. James, and known as the "Meramec" Iron mine. This once famous mine is one of the oldest iron mines in the State; it was opened in 1826. It has been worked but little during the past year, on account of the small demand for ore. Some mining has also been done during the year at the Brower and Lenox mines; but they were all idle at date of inspection (July, 1891).

James, E. W.—Mines located in the vicinity of St. James. The principal ore produced during the past year came from what is known as the "Dowling" mine, located about 3 miles south of St. James. None of the mines were in operation at date of inspection; nor are they worked regularly. I was told by Mr. James that no regular miners were employed; that what mining was done was by farmers and farm laborers. He also said that the most of the ore produced by him was used for making paint.

ST. FRANCOIS COUNTY.

Iron Mountain company—Chas. C. Maffitt, president, and Chas. A. Pilley, secretary and superintendent. Mines located at Iron mountain; connected with Iron Mountain railroad by switches.

This is the most elaborately equipped plant in the State, a machine shop being run in connection with the mines, where the repairing of machinery, tools, etc., is done, and a great many of the mining drills are also made.

The shipments have fallen off considerably during the past year, as compared with the year preceding; the cause of this was due to the limited demand for ore. But the output has probably been equally as great as it was in 1889, the ore having been stocked at the mines. I am told that no less than 162,000 tons of ore are now lying in stock, which can be put on the market at any time desired. All underground machinery is run by compressed air, consisting of drilling machines, pumps and hoisting engines.

Mining was being done in two shafts, three slopes and two or three open cuts, date of inspection (June 20), giving employment to about 250 hands; wages vary from \$1.15 to \$1.92 per day.

Following is a partial description of each mine, with statement as to the condition they were found in at date of inspection.

Shaft No. 1—Is 216 feet deep; machinery, safety catches and cages in good condition. This is the most extensive underground mine upon the property, the main heading having been driven 1400 or 1500 feet from the bottom of hoisting shaft; the ore varies from 10 to 40 feet in thickness, and dips to the southeast at an angle of 12° or 14° . The ore is worked from the shaft bottom to the dip and is hoisted up the slope by two stationary engines, one located at the top of slope and about 130 feet from the hoisting shaft, the other about 650 feet down the slope. Ventilation has been much improved during the past year by bratticing between pillars from bottom of hoisting shaft to near head of gangway, and erecting a chimney over the upcast air chamber, thus furnishing a good air-course which keeps the workings well ventilated.

Shaft No. 2—Steam plant; machinery, safety catches, cages, etc., in good condition. The ore having been worked from the surface to a depth of 169 feet, is in reality an open cut; yet the ore is hoisted through a shaft located 150 feet from the cut, the two being connected by a tunnel run on a level between the cut and the bottom of the shaft.

Slope No. 1—Steam plant; slope is about 290 feet long and dips at an angle of probably 30° .

Slope No. 2—Steam power; the slope is about 455 feet long. The overlying roof is not good, but is kept well timbered.

No. 3 is also a slope about 220 feet long.

TABLE XIII.—Showing tonnage and value of output of Iron mines, year ending June 30, 1891.

Company.	Address.	No. of mines producing ore.		Machinery in use.		Employees.			Average wages of employes.				Total No. of tons mined.	Average value per ton	Total value of year's output
				Boilers.	Pumps.	Miners.	Others.	Total employes.	Bosses.	Miners.	Laborers.	Engineers.			
Crawford county.	St. James.	1				4	2	6	\$1.50	\$1.10	\$1.10	\$1.50	939	\$2.35	\$2,183.15
	Midland	1		3	2	42	10	52	\$1.50	\$1.10	\$1.10	\$1.50	40,065	2.40	96,163.00
Dent county.	Condray					20	10	30	2.33½	1.00	1.00	1.25	3,694	2.25	8,154.00
	Sligo blast furnace	1		2	1	16	12	28	1.50	1.25	1.00	1.50			
	Sligo furnace Co.	1		1	2	12	15	27	3.10	1.35	1.00	1.50	4,473	2.25	10,063.00
	Missouri Iron Co.	1		1		8		8					100	2.25	225.00
Howell county.	A. C. & John Casey	1													
	Salem.														
Lamons D. Carson Iron Co.	West Plains.	1				15	5	20					4,420	1.50	6,705.00
	Iron county.														
St. Louis Ore & Steel Co.	Pilot Knob	1				25	15	40					14,830	1.60	23,738.00
	Phelps county.														
St. James.	St. James.	1				3	2	5					700	3.00	2,100.00
	Wm. James	1				8	5	13		1.10	1.10		2,302	2.80	6,445.60
St. Francois county.	St. James.														
	Iron Mountain Co.	7		7	8	104	115	219	1.92	1.83	1.15	1.65	66,914	2.62	175,906.78
Totals.	Iron Mountain	17		14	15	257	191	448					188,356	2.89	831,665.48

*No ore shipped during the year.

LIST OF IRON MINE OPERATORS IN MISSOURI

That were operating mines during the past year, with location and postoffice address.

Name of mine operator or company.	Postoffice.	Mine located near
CRAWFORD COUNTY.		
Meramec Iron Mining Co.....	Midland.....	Midland.....
DENT COUNTY.		
Midland Blast Furnace Co....	Midland (Crawford Co.)	Condray
Sligo Furnace Co....	Sligo.....	Sligo.....
Missouri Iron Co.....	Salem.....	Salem
A. C. and Jno. Casey	"	"
HOWELL COUNTY.		
Lemons D. Carson Iron Co.	West Plains.....	West Plains
IRON COUNTY.		
St. Louis Ore and Steel Co.....	St. Louis.....	Pilot Knob.....
PHELPS COUNTY.		
Wm. James.....	St. James	St. James.....
E. W. James	"	"
ST. FRANCOIS COUNTY.		
Iron Mountain Co.....	Iron Mountain.....	Iron Mountain.....

MISSOURI'S OUTPUT OF MINERAL

COMPARED WITH OTHER STATES.

I have compiled several tables from United States census bulletins showing the output of mineral in which Missouri is especially interested.

An examination of these tables reveals the fact that Missouri stands pre-eminently above all other States in the production of zinc, second in lead, ninth in coal and tenth in iron.

The cause of the discrepancy between the tables compiled from census bulletins and my report was by the statistics being collected for different periods. The census bulletins are for the calendar year 1889, while my report is for the year ending June 30, 1891.

Following are the tabulated tables showing the different minerals, with general remarks on each table.

THE COAL PRODUCT OF THE UNITED STATES.

The following table compiled by the Colliery Engineer from census bulletins reveals some interesting facts. It shows that coal is mined in 29 of the 44 States of the Union, and that the coal-fields are so located as to be convenient not only to the present great centers of population, but also convenient to the portion of our territory that is most rapidly being populated by immigration. The table also shows that the coal product has almost doubled in the past decade. The number of collieries given represents only those that ship their product to market.

Small mines worked for local trade are not included.

Table showing a condensed census of the Coal Industry of the United States.

States.	Production in short tons in year 1889...	Production in short tons in year 1880...	Increase	No. of persons employed at collieries.	No. of collieries
Pennsylvania { Anthracite.	45,544,970	28,640,819	16,904,151	125,229	342
{ Bituminous.	36,174,089	18,425,163	17,748,926	53,780	525
Illinois.....	12,104,272	6,115,377	5,988,895	23,934	358
Ohio.....	9,976,787	6,008,595	3,968,192	19,343	323
West Virginia.....	6,231,880	1,829,844	4,402,036	9,778	115
Iowa.....	4,061,704	1,461,116	2,600,588	9,198	172
Alabama.....	3,378,434	323,972	3,054,512	6,762	44
Maryland.....	2,939,715	2,228,917	710,798	3,734	31
Indiana.....	2,845,057	1,454,327	1,390,730	6,448	94
Missouri.....	2,567,823	844,304	1,723,519	6,739	123
Kentucky.....	2,399,775	946,288	1,453,487	5,144	79
Colorado.....	2,360,536	462,747	1,897,789	4,645	53
Kansas.....	2,230,763	771,142	1,459,621	5,065	127
Tennessee.....	1,925,689	495,131	1,430,558	4,108	39
Wyoming.....	1,888,947	589,595	799,352	2,692	15
Washington.....	993,724	145,015	848,709	1,847	12
Virginia.....	865,786	43,079	822,707	1,555	11
Indian Territory.....	752,832	.....	752,832	1,867	10
New Mexico.....	486,983	.....	486,983	1,034	18
Montana.....	363,301	224	363,077	857	8
Arkansas.....	279,584	14,778	264,806	588	8
Utah.....	236,601	.....	236,601	565	4
Georgia and North Carolina.	226,156	154,994	71,162	733	3
California and Oregon.....	186,179	280,155	*93,976	443	10
Texas.....	128,216	.....	128,216	549	4
Michigan.....	67,431	100,800	*33,369	261	6
Dakota and Nebraska.....	30,307	200	30,107	76	5
Totals.....	140,747,591	71,336,582	69,411,009	296,974	2,539

* Decrease.

NOTE.—The production given in first column is for calendar year 1889. That in the second column is for the year ending May 31, 1880.

By an examination of the foregoing table, it will be seen that during the decade, Missouri's coal output has increased from 844,304 tons in 1880, to 2,567,823 tons in 1889, showing an increase of 205 per cent.

COAL PRODUCED WEST OF THE MISSISSIPPI RIVER IN 1889.

Bulletin, issued March 21, states that coal production west of the Mississippi river has increased more than three-fold during the past decade, or from 4,584,324 tons in 1880 to 16,067,500 tons in 1889. The value per ton at the mines decreased from \$1.93 in 1880 to \$1.52 in 1889.

By a glance at the following table it will be seen that Missouri is the second coal-producing State west of the Mississippi river:

States.	Tonnage and value.		No. of mines.	
	Product, tons	Av. price per ton.	Regular establishments	Local mines.
Iowa.....	4,061,704	\$1 33	172	223
Missouri.....	2,567,823	1 35	123	356
Colorado.....	2,360,536	1 53	53	40
Kansas.....	2,230,763	1 48	127	295
Wyoming.....	1,388,947	1 26	15	10
Washington.....	998,724	2 22	12	.....
Indian Territory.....	752,832	1 76	10	.....
New Mexico.....	486,983	1 79	18	12
Montana.....	363,301	2 43	8	22
Arkansas.....	279,584	1 42	8	16
Utah.....	236,601	1 60	4	7
California and Oregon.....	186,179	2 43	10	1
Texas.....	128,216	2 63	4	6
Dakota and Nebraska.....	30,307	1 53	5	338
Total.....	16,067,500	1 52	569	1,326

LEAD AND ZINC OUTPUT OF THE UNITED STATES,

As shown by the census bulletin issued June 18, 1891, for the year 1889.

An examination of the following table shows the fact that Missouri produced a little more than three-eighths of all the zinc mined in the United States, and that only one state leads her in the production of lead :

OUTPUT OF LEAD AND ZINC IN THE UNITED STATES.

Name of State or Territory.	No. tons mined.	
	Lead.	Zinc.
Colorado	70,788	.....
Missouri.....	44,482	93,131
Idaho.....	23,172	.....
Utah	16,675	.....
Montana.....	10,183	.....
New Mexico.....	4,764	140
Kansas	3,617	39,575
Arizona	3,158	.....
Nevada..	1,994	.....
Wisconsin	1,678	24,832
Illinois	173	.....
South Dakota.....	116	.....
California.....	53	.....
Arkansas	20	130
Pennsylvania and New Jersey.....	.....	63,339
Iowa .....	.....	450
Southern States	268	12,906
Total.....	181,141	234,503

THE IRON OUTPUT OF THE UNITED STATES IN 1889.

The following table may be of interest to a great many of our mining men. The information contained in it was compiled from a bulletin issued September 24, 1891. It shows the number of mines in operation, amount of ore marketed in each state and territory, and the market value of same. The output is given in long tons of 2,240 pounds.

PRODUCT AND VALUE OF IRON ORE PRODUCED IN 1889, BY STATES AND TERRITORIES.

States and territories.	No. of mines.	No. of tons produced.	Value per ton.	Total value.
Michigan	73	5,756,370	\$2 70	\$15,588,369
Pennsylvania	189	1,550,567	1 96	3,045,100
Alabama.....	45	1,526,982	96	1,457,314
New York.....	35	1,219,870	2 49	3,028,676
Minnesota	4	858,967	2 87	2,464,419
Wisconsin	16	814,087	2 20	1,798,403
Tennessee	16	486,313	1 28	629,454
New Jersey.....	24	418,869	3 23	1,352,509
Ohio.....	70	241,420	2 09	515,148
Missouri	8	225,019	2 11	470,457
Colorado.....	18	103,571	4 47	469,546
Kentucky	4	78,286	1 75	133,885
Texas	2	8,900	1 52	16,554
Virginia and West Virginia	38	494,805	1 83	894,951
Georgia and North Carolina.....	17	245,440	1 29	317,372
New Mexico and Utah.....	2	35,550	1 97	69,956
Oregon and Washington...	3	27,118	1 49	40,389
Delaware and Maryland.....	14	22,202	2 32	54,469
Idaho and Montana.....	7	21,749	6 60	140,647
Connecticut, Maine and Massachusetts.	7	91,807	3 01	278,888
Totals	592	14,227,896	2 30	32,766,506

MINING LAWS OF MISSOURI.

CHAPTER 115.

ARTICLE I.

MINES AND MINING.

SECTION

- 7034. Rights of miners and owners of mining lands—condition of permits.
- 7035. Forfeiture.
- 7036. Tender of payment.
- 7037. Notice to owner or lessee.
- 7038. Sale of ore.
- 7039. Injunction or restraining orders—notice of application to dissolve.
- 7040. Affidavit of course of drift and order to be made.
- 7041. Order to be read.
- 7042. Refusal to obey order a misdemeanor.
- 7043. Owner or lessee shall drain mine, etc.
- 7044. Scrapping for ore prohibited, etc.—penalty.
- 7045. Indemnity bond required to mine in certain cities, etc.—violation a misdemeanor—penalty.
- 7046. Notice of intention to mine, publication required.
- 7047. Petition to circuit court—court to fix and approve bond.

SECTION

- 7048. Testimony on application—bond, etc.—time granted.
- 7049. Bond required.
- 7050. Written permission of property owner—violation, misdemeanor—penalty, fines, etc.
- 7051. Costs attending notice.
- 7052. Diagram of mines, etc., to be filed in court.
- 7053. Application of article to mining companies.
- 7054. Screening coal before weighing prohibited.
- 7055. Weighman shall take an oath, etc.—penalty.
- 7056. Penalty for using false scales.
- 7057. Shall apply to loaders in certain mines.
- 7058. Checks redeemable in money or goods, etc.
- 7059. Employees to be paid monthly, etc.
- 7060. Refusal to redeem orders—penalty.

SEC. 7034. *Rights of miners and owners of mineral lands—condition of permits.*—

When any person owning real estate in this state, or any person having a leasehold interest in such real estate for mining purposes by lease from the owner thereof, duly acknowledged and recorded in the county wherein the land lies, shall permit any person or persons, other than their servants, agents or employes, to enter and dig or mine thereon for lead ore or other minerals, with the consent of such owner or owners or lessee, he or they shall keep a printed statement of the terms, conditions and requirements upon which such lands may be mined or prospected, and the time during which the right to mine or prospect thereunder shall continue, posted or hung up in a conspicuous place, in plain, legible characters, in the principal office or place of business of such person or company in the county in which said lands are situated, or in a county contiguous thereto, and shall deliver to any person mining or prospecting, or about to mine or prospect on said lands, and requesting it, a printed copy of such statement; all persons digging or mining on said lands, after the posting up of such statement, shall be deemed to have agreed to and accepted the terms thereof, and shall, together with such owner or lessee, be bound thereby, and upon failure or refusal to comply with the terms, conditions and requirements of such statement, he or they shall forfeit all right thereunder, and the owner or lessee, as aforesaid, of such lands, may re-enter thereon and take possession of the same, nor shall the receipt of any ore or mineral by any such

owner or lessee, after any such forfeiture has been incurred, be deemed or taken as a waiver of such forfeiture. (R. S. 1879, § 6441—*a*)

Sec. 7035. *Forfeiture*.—Whenever any such owner or lessee of real estate shall permit any person or persons, other than their servants, agents or employes, to enter and dig for lead ore or other minerals on such real estate, with his consent, but without such owner or lessee complying with the provisions of section 7034, and such person or persons having so entered upon said lands by the permission or consent of such owner or lessee as aforesaid, and having in good faith dug or opened any shaft, mine, quarry, prospect or deposit of mineral, or extended or opened from any shaft or mine any room, drift, entry or other excavation, he or they shall have the exclusive right as against such owner or lessee giving such permit or consent, and against any person claiming by, through or under such owner or lessee, to continue to work, mine and dig such shaft, mine, prospect or deposit of mineral so dug or opened by him or them as aforesaid, in said real estate, with a right of way over such lands for the purpose of such mining, for the term of three years from the date of the giving of such consent or permit: *Provided, however*, that if such person or persons, in each case so mining as aforesaid, shall fail or neglect to work or cause to be worked such shaft, mine, quarry, prospect or deposit of mineral for ten days, not including Sundays, in any one calendar month, after commencing said work, he or they shall forfeit all rights to work, mine or hold the same as against such owner or lessee, unless such failure or neglect was caused by unavoidable circumstances, or by the act of such owner or lessee or his agent, or unless such owner or lessee consent thereto: *Provided further*, that such person or persons, so mining as aforesaid, shall pay to the owner or lessee of said lands giving such permit or consent the royalty for mining thereon, at least once every month, if demanded by such owner or lessee, by delivering the same to him at or near the mouth or opening of such mine, shaft or quarry, or at the nearest usual place of business of such owner or lessee, or at any other place that may be agreed upon by such miner and owner or lessee; which said royalty, unless otherwise agreed upon by them, shall be the same in kind and proportionate amount as is paid by others mining the same kind of ore or mineral on said lands to such owner or lessee, or the value of such royalty in cash; and if there be no other person mining on said lands on terms prescribed by such owner or lessee, then he or they shall pay to such owner or lessee the same rate and kind of royalty on lead ore or minerals taken out by him or them as is paid by miners on lands nearest thereto belonging to other persons, or the value of such royalty in cash. Such owner or lessee of any real estate shall have a lien on all minerals taken or dug therefrom for the royalty due thereon until the same is paid; and if any such person or persons so mining shall refuse or fail to pay such royalty to such owner or lessee, or his agent, when demanded as aforesaid, he or they shall thereby forfeit the right to work such mine, shaft, quarry, prospect or deposit of mineral, and the said owner or lessee may thereupon enter and take possession of the same. (R. S. 1879, § 6442.)

Sec. 7036. *Tender of payment*.—Any such person or persons who, by the permission or consent of the owner or lessee of any real estate, and having the right to mine thereon, and having entered and dug or mined thereon any lead ore or other mineral, shall have the right to the exclusive possession of such ore or mineral, except the royalty thereon, which shall be paid as hereinbefore provided, until he or they shall be paid or tendered by such owner or lessee of such real estate the then highest market price in cash paid by such owner or lessee for the same kind

(*a*) The statement in this section amounts to a license, revocable upon condition broken, and when forfeited proprietor may re-enter and take possession. 74 Mo. 178.

of ore or mineral dug or mined on said lands, and if no other such ores or minerals are at the time being dug or mined on said lands and sold to such owner or lessee, then the highest price paid for such ore or mineral dug on lands nearest thereto shall be paid or tendered by such owner or lessee in such case, and upon such payment or tender, the absolute right to the possession of such lead ore or other mineral so dug out and mined under the provisions of the next preceding section, and for which such payment or tender shall have been made, shall vest in such owner or lessee. (R. S. 1879, § 6443.)

SEC. 7037. *Notice to owner or lessee.*—If any person or persons having dug or mined lead ore or other mineral, and having the same in his or their possession, and having offered to deliver such mineral according to contract, or paid or tendered the royalty, if any, due thereon, or the value of such royalty in cash, to such owner or lessee of said real estate, or to his agent, shall serve or cause to be served a notice in writing upon such owner or lessee or his agent, by delivering to him a copy thereof, or by leaving a copy thereof at the usual place of abode of such owner, lessee or agent, with some member of the family over the age of fifteen years, stating in such notice the amount of lead ore or other mineral he or they have ready for delivery, and requiring such owner, lessee or agent to receive and pay for the same, the said owner or lessee shall, within five days after the service of such notice, receive and pay for such lead ore or other mineral which the said person or persons digging or mining the same may deliver to him, not exceeding the amount named in the notice; and in such case, if such owner or lessee fail or refuse within the time aforesaid to pay for such lead ore or mineral delivered or offered to be delivered to him as aforesaid at the said price, then in that event the said person or persons who dug and mined the same shall thereupon acquire an absolute title to such lead ore or mineral, and may thereupon dispose of the same to any person or in any manner he or they may choose. (R. S. 1879, § 6444.)

SEC. 7038. *Sale of ore*—All lead ore or other mineral, dug or mined in or upon the lands of any person in this state, shall be deemed and held to be the absolute property of the owner or lessee of such lands, except in cases it is modified, changed or transferred by express contract; and any person who shall unlawfully sell or convert to his own use, or remove or dispose of, or in any manner make away with or conceal any such ore or mineral, so as to deprive the owner thereof of the same, shall be deemed guilty of grand or petit larceny, according to the value of such ore or mineral. (R. S. 1879, § 6445.)

SEC. 7039. *Injunction or restraining orders—notice of application to dissolve.*—No injunction or restraining order shall be granted by any court or by any judge thereof to enjoin or restrain the working of any mine or mines, or in any manner to interfere with the same, except upon notice first being given to the person working or operating said mine or mines, and sought to be enjoined or restrained, which notice shall be served by delivering to such person a copy thereof, or by leaving a copy thereof at his usual place of abode with a member of the family over the age of fifteen years, at least five days before the day set for the hearing of the application for the injunction; and the court or judge granting such injunction or restraining order shall have the power, upon good cause being shown, to dissolve, vacate or modify any such injunction or restraining order at any time after the same shall have been granted, whether in term—time or vacation: *Provided*, that the party applying to such court or judge to dissolve, vacate or modify any such injunction or restraining order shall give due notice to the opposite party of such intended application. (R. S. 1879, § 6446.)

SEC. 7040. *Affidavit of course of drift and order to be made.*—When any owner, tenant or sub-tenant of a lot or lots or tract of land, shall file with any justice of

the peace within the county in which said lot or lots or tract of land may be situated his or her affidavit, or the affidavit of any other creditable person for them, stating that from knowledge, information or belief, the party or parties owning, controlling or working the adjoining lot or lots or tract of land, and upon which said party or parties are sinking shafts, mining, excavating and running drifts, and that said drifts in which said parties are digging, mining and excavating mineral ore or veins of coal extend beyond the lines and boundaries of said lot or lots or tract of land, owned, controlled or worked by them, and have entered in and upon the premises of the party or parties making said affidavit, or for whom said affidavit is made, the justice of the peace, after first being tendered his lawful fees, shall issue his written order and deliver or cause the same to be delivered to the county surveyor or his deputy, commanding him, after his reasonable fees have been tendered, to proceed without delay to survey said drift by entering any and all shafts upon said lot or lots or tract of land that he (the surveyor) may see fit, for the purpose of ascertaining the course and distance of said drift or drifts, and to locate the same upon the surface. (R. S. 1879, § 6447.)

SEC. 7041. *Order to be read.*—The surveyor shall, before entering upon said duty, read said order to the party or parties owning, controlling or working any shaft or shafts on said lot or lots or tract of land. (R. S. 1879, § 6448.)

SEC. 7042. *Refusal to obey order a misdemeanor.*—If said party or parties owning, controlling or working said shaft or shafts on said lot or lots or tract of land shall refuse, hinder or prevent said county surveyor or his deputy and his assistant from entering said shaft or shafts or drifts, to make the survey so ordered by the justice of the peace, and every person so offending shall, on conviction, be adjudged guilty of a misdemeanor, and punished by imprisonment in the county jail for a term of not exceeding one year, or by fine not exceeding three hundred dollars, or by both said fine and imprisonment. (R. S. 1879, § 6449.)

SEC. 7043. *Owner or lessee shall drain mine, etc.*—When any person owning any real estate in this state, or any person or persons having a leasehold therein for the purpose of mining for lead or zinc ore thereon by lease from such owner, shall open such real estate for mining purposes, and shall permit any person or persons other than their agents, servants or employes to enter and dig or mine for lead or zinc ores thereon, and shall make any rule or contract whereby any pump-rent or royalty is reserved unto said land owner or lessee for the drainage of the land so mined, and shall fail or refuse to drain any such land or mining lot to the full depth to which the laborers are working or seeking to work, but prevented by water, then and in such event, such owner or lessee thereof shall not be entitled to collect or retain any pump-rent or royalty so reserved as aforesaid, for any ores taken from said mine or lot below the depth of the water level in said mine or lot, so long as said owner or lessee shall fail or refuse to drain said mine, nor shall such land owner or lessee be entitled to forfeit any right to hold and mine said lot so long as work is prevented therein by reason of water accumulated therein, on account of any failure to drain said mine by such land owner or lessee, any rule, contract or agreement to the contrary notwithstanding. (New section.)

SEC. 7044. *Scrapping for ore prohibited, etc.—penalty.*—It shall be unlawful for any person to take or in any manner receive or obtain any lead or zinc ore by means of gleaning or culling, commonly called "scrapping," without first having obtained the written consent of the person having possession and control of the mine from which said ores are to be taken; and it shall be unlawful for any person or company of persons to purchase or in any manner to receive any lead or zinc ore which may have been stolen or taken by means of culling or gleaning, commonly called "scrap-

ping," without such written consent as aforesaid, knowing that said ores have been so stolen or taken without written consent, as herein provided. Any person violating the provisions of this section, on conviction, shall be punished by fine of not more than one hundred dollars, or by imprisonment in the county jail not more than one year, or by both such fine and imprisonment, and the inadequacy of the price paid for such ore, the quantity purchased or received, and the fact that the person from whom such ores may have been purchased or received is not regularly engaged in running or operating mines for such ores, may be shown, and shall be received as *prima facie* evidence of guilty knowledge of the person so purchasing or receiving such ores: *Provided, however*, that nothing herein contained shall be construed as to prevent any person from gleaning, culling or scrapping for ores about his own mine, nor to prevent any person from purchasing such ores when the same have been obtained in such manner by the owner or operator of any such mine. (New section.)

SEC. 7045. *Indemnity bond required to mine in certain cities, etc.—violation a misdemeanor—penalty.*—No person, company or corporation shall hereafter sink a shaft, mine, tunnel, excavate or drift for coal, or take out any coal of any kind within the corporate limits or designated boundaries of any city, town or village in this state containing one thousand inhabitants or more, without having first applied and filed, and have approved, an indemnity bond as hereinafter provided for; and any person or persons violating the provisions of this section, and any member or stockholder or officer of any company or corporation who shall violate the provisions of this section, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by fine of not less than five hundred dollars, or imprisonment in the county jail for not less than six months, or by both such fine and imprisonment. (R. S. 1879, § 6450.)

SEC. 7046. *Notice of intention to mine—publication required*—Every person, company or corporation desiring to carry on any of the mining operations provided for in the preceding section shall give at least thirty days' notice of such intention by notice printed and published in some newspaper printed in such town, city or village wherein such mining operations are proposed to be carried on, or if no newspaper be printed in such city, town or village, then in some newspaper printed in said county, or if no newspaper be printed in such county, then by written or printed hand-bills posted up in six public places in the city, town or village wherein such mining operations are proposed to be carried on. Such notice shall contain an accurate description of the locality where such mining operations are to be carried on, giving the number of lot and block, and shall also state the nature of such mining operations, and name some day of the term of the next circuit court in said county, thereafter to be holden, when such person, company or corporation will offer for filing and approval the indemnity bond hereinafter provided for. (R. S. 1879, § 6451.)

SEC. 7047. *Petition to circuit court—court to fix and approve bond.*—On the day mentioned in such notice, the persons, company or corporation proposing to carry on such mining operations shall present their petition to said circuit court, setting out the locality of the proposed mining operations, and shall also file with such petition the title papers of such person or company or corporation to the lands on which such mining operations are proposed to be carried on, showing either the fee simple title of such land in such company, or the right to mine beneath or in such land, and shall also contain the names of all persons to be offered as security upon the mining bond of such persons, company or corporation, and shall pay the court to fix and approve the mining bond of such persons or corporations. (R. S. 1879, § 6452.)

SEC. 7048. *Testimony on application—bond, etc.—time granted.*—The court may, upon such application, hear testimony upon all the matters involved in such application, including testimony upon the solvency and responsibility of the sureties offered, and may hear testimony from any parties interested in the lots and lands in the neighborhood of such proposed mining operations, and if the court is satisfied that the proposers own the land or mining privileges under the land described in their petition, the court shall fix the amount of the bond to be given by such proposers, such bond to be in no case for less than one thousand dollars; and upon the giving and approval of such bond so fixed by the court, the court shall enter its order authorizing the mining operations specified in said petition, and upon the localities therein named, and not elsewhere, for the space of two years, unless in the meanwhile revoked. (R. S. 1879, § 6453.)

SEC. 7049. *Bond required.*—Such bond shall be signed by the proposers, and by not less than two sureties, to be approved by said court, residents of the county wherein such mining is to be carried on, and shall be made payable to the state of Missouri, and conditioned that the principal in said bond shall carry on the mining operations proposed in the petition in a careful manner, and the said parties shall not mine, dig, excavate nor take coal nor earth from or under any land or lots than that described in the said bond, and shall pay all the damages that may be sustained by any and all persons by reason of the violation of any of the conditions of said bond, and any and all charges, fines and penalties that may be levied, assessed against or imposed upon the said proposers, their agents, servants, stockholders, officers or employees, by reason of any violation of the conditions of said bond or any of the provisions of this law. (R. S. 1879, § 6454.)

SEC. 7050. *Written permission of property owner—violation, misdemeanor—penalty, fines, etc.*—Any person or persons who shall in person or by their servant, agent or employe, dig, excavate, mine, tunnel or drift upon or under the lands or lots of another, within the incorporate limits or designated boundaries of any city, town or village in this state, and every officer and stockholder that shall either authorize or permit its servants, agents or employes to dig, excavate, mine, tunnel or drift upon or under the lands or lots of another within such limits or boundaries of such city, town or village, without the written permission of the owner or owners of such land or lots, shall be deemed guilty of a misdemeanor, and shall be punished, on conviction, for every such offense, by fine of not less than five hundred dollars, with costs, which fine and costs, if not paid within five days after conviction, may be sued for and recovered against the parties and sureties on the mining bond of such persons, company or corporation liable for such acts, in a suit upon such bonds in the name of the state of Missouri, to the use of the county in which such offense is committed; such fine, when collected, shall be paid, one-half to the owner of the property injured by such offense and the other half into the school fund of such county; but no such conviction shall be a bar to the owner of such property prosecuting a suit on said bond to his own use for the damages sustained by any such offense. Every such conviction, whether appealed from or not, shall work a forfeiture of the authority to mine granted such person, company or corporation liable, and they shall not proceed further with the operations, except by making application and giving a new bond as in the first instance. (R. S. 1879, § 6455.)

SEC. 7051. *Costs attending notice.*—The costs attending the giving notice, making application and receiving mining privileges shall all be paid by the person, company or corporation making the same, and no such privilege shall take effect until all such costs be paid. (R. S. 1879, § 6456.)

SEC. 7052. *Diagram of mines, etc., to be filed in court.*—At each term of the circuit court, during the continuance of any mining license, every person, company or corporation carrying on such mining operations shall, at their own expense, cause to be made by the county surveyor of the county where such mines are located, and filed with the court, under oath of such surveyor, a complete and true diagram of such mines, showing with reference to the boundaries of such mines, and the lots and lands of neighboring owners, the extent of such mines, their drifts, tunnels and excavations, giving the length and breadth of each drift, bank and tunnel, so as to fully inform the court and parties in interest of the extent and character of such mining operations. Such plats and diagrams shall remain on file with the clerk of such court, and shall not be removed by any one from the files of such court. Any failure to file the diagram and plat herein provided for, or to make such diagram show all the particulars herein provided for, shall work a forfeiture of the mining privileges of such person, company or corporation, which forfeiture the court shall, on the motion of any party in interest, declare on three days' notice to the party holding such license or privilege. (R. S. 1879, § 6457.)

SEC. 7053. *Application of article to mining companies.*—In no case shall the eight preceding sections of this article be so construed as to apply to persons, companies or corporations engaged in mining for lead, zinc or other ores of minerals except coal. (R. S. 1879, § 6458, amended.)

SEC. 7054. *Screening coal before weighing prohibited.*—It shall be unlawful for any mine owner, lessee or operator of coal mines in this state, employing miners at bushel or ton rates, or other quantity, to pass the output of coal mined by said miners over any screen or other device which shall take any part from the value thereof, before the same shall have been weighed and duly credited to the employe sending the same to the surface, and accounted for at the legal rate of weights as fixed by the laws of Missouri. (Laws 1885, p. 207.)

SEC. 7055. *Weighman shall take an oath, etc., penalty.*—The weighman employed at any mine shall subscribe an oath or affirmation before a justice of the peace, or other officer authorized to administer oaths, to do justice between employer and employe, and weigh the output of coal from the mines as herein provided. The miners employed by or engaged in working for any mine owner, operator or lessee of any mine in this state shall have the privilege, if they desire, of employing at their own expense a check weighman, who shall have like rights, powers and privileges in the weighing of coal as the regular weighman, and be subject to the same oath and penalties as the regular weighman. Said oath or affirmation shall be kept conspicuously posted in the weigh office, and any weigher of coal, or person so employed, who shall knowingly violate any of the provisions of this article, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by fine of not less than twenty-five nor more than one hundred dollars for each offense, or by imprisonment in the county jail for a period not to exceed thirty days, or by both such fine and imprisonment, proceedings to be instituted in any court having competent jurisdiction. (Laws 1885, p. 208, amended, Laws 1887, p. 218, amended.)

SEC. 7056. *Penalty for using false scales.*—Any person or persons having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever, by reason of which such coal is not correctly weighed and reported in accordance with the provisions of this article, shall be deemed guilty of a misdemeanor, and shall, upon conviction, for each such offense, be punished by a fine of not less than two hundred dollars nor more than five hundred dollars, or by imprisonment in the county jail for

a period not to exceed sixty days, or by both such fine and imprisonment, proceedings to be instituted in any court of competent jurisdiction. (Laws 1885, p. 208.)

SEC. 7057. *Shall apply to loaders in certain mines.*—The manner of weighing, as hereinbefore provided for, shall apply to the class of workers in mines known as loaders, engaged in mines wherein the mining is done by machinery, whenever the workmen are under contract to load coal by the bushel, ton, or any quantity the settlement of which is had by weight. (Laws of 1885, p. 208, amended.)

SEC. 7058. *Checks redeemable in money or goods, etc.*—It shall not be lawful for any corporation, person or firm engaged in manufacturing or mining in this state to issue, pay out or circulate for payment of the wages of labor, any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the United States, unless the same is negotiable and redeemable at its face value, without discount, in cash or in goods, wares or merchandise or supplies, at the option of the holder, at the store or other place of business of such firm, person or corporation, or at the store of any other person on whom such paper may be drawn, where goods, wares or merchandise are kept for sale, sold or exchanged; and the person who, or corporation, firm or company which, may issue any such order, check, memorandum, token or other evidence of indebtedness, shall, upon presentation and demand, within thirty days from date or delivery thereof, redeem the same in goods, wares, merchandise or supplies at the current cash market price for like goods, wares, merchandise or supplies, or in lawful money of the United States, as may be demanded by the holder of any such order, memorandum, token or other evidence of indebtedness: *Provided*, that if said corporation, person or firm engaged as specified in this section have a regular pay-day once in every thirty days, then said corporation, person or firm shall not be required to redeem such token or evidence of indebtedness in cash until the first pay-day after the same become payable, as herein provided, and such token or evidence of indebtedness shall be presented for payment in cash only on such pay-days. (Laws 1881, p. 73, amended, Laws 1885, p. 83.)

SEC. 7059. *Employees to be paid monthly, etc.*—The employees of operators of mines mentioned in this article shall be regularly paid at least once in every thirty days, and at no pay-day shall there be withheld of the earnings of any employee any sum to exceed the amount due him for his labor for the four days next preceding any such pay-day. And such operators shall, whenever demand therefor shall be made by any employee, issue to such employee a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on any pay-day, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employees, or to issue to them his due-bills as in this section provided, shall become immediately liable to any such employee in double the sum due such employee at the time of such failure or refusal, to be recovered by civil action in the name of such employee in any court of competent jurisdiction of the state. And no employee within the meaning of this article shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof. (New section.)

SEC. 7060. *Refusal to redeem orders—penalty.*—Any officer or agent of any corporation, or any person, firm or company engaged in the business of manufacturing or mining in this state, who by themselves or agent shall issue or circulate in payment for wages of labor any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the

United States, without being negotiable and payable at the option of the holder in goods, wares, merchandise, supplies or lawful money of the United States, as required by section 7058 of this article, or who shall fail to redeem the same when presented for payment within thirty days from date of delivery thereof, by said company or its agent at his or their office or place of business, in lawful money of the United States, or who shall compel or attempt to coerce any employe of any such corporation, person, firm or company to purchase goods, wares, merchandise or supplies from any particular person, firm or corporation, shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than five hundred dollars for each and every such offense. (Laws 1885, p. 84.)

ARTICLE II.

SAFETY AND INSPECTION OF MINES.

SECTION

- 7061. Maps of mines to be prepared, etc.
- 7062. Inspector to make maps if owner fails, etc.
- 7063. Escapement shafts, when and how constructed, etc.
- 7064. Ventilation, fire-damp.
- 7065. Bore-holes.
- 7066. Signaling—hoisting—certain minors not to work, etc.
- 7067. Regulations for hoisting.
- 7068. Bollers, fencing entrances—signals, etc.

SECTION

- 7069. Accidents—duty and power of inspector, etc.
- 7070. Fines, how recovered.
- 7071. Governor to appoint inspector, etc.
- 7072. Duties of inspector—reports.
- 7073. Inspector may enter mines at any time, etc.
- 7074. In case of injury or death, right of action.
- 7075. Rules of working mines—penalty.
- 7076. Prop-timbers.
- 7077. Explosives to be kept in strong box, etc.

SEC 7061. *Maps of mines to be prepared, etc.*—The owner, agent or operator of each and every mine in this state, employing ten or more men, shall make or cause to be made, at the discretion of the inspector or other person acting in that capacity, an accurate map or plan of the workings of such mine and each and every vein thereof, showing the general inclination of the strata, together with any material deflections in the said workings and the boundary lines of said mine, and deposit a true copy of said map or plan with the clerk of the county court of each county wherein may be located the said mine; which said map or plan shall be so filed or deposited within three months after the time when this article shall take effect, and a copy of such map or plan shall also be kept for inspection at the office of said mine; and during the month of January of each and every year after this article shall have taken effect, the said owner, agent or operator shall furnish the inspector and the clerk of the county court as aforesaid with a statement, and a further map or plan of the progress of the workings of such mine, continued from the last report to the end of the month of December next preceding, and the inspector shall correct his map or plan of said workings in accordance with the statement and map or plan thus furnished; and when any mine is worked out or abandoned, that fact shall be reported to the inspector, and the map or plan of such mine in the office of the clerk of the county court shall be carefully corrected and verified. (Laws 1887, p. 219.)

SEC. 7062. *Inspector to make map if owner fails—cost.*—Whenever the owner, agent or operator of any mine shall neglect, fail or refuse to furnish the said inspector and clerk as aforesaid with a statement, the map or plan or addition thereto, as provided in the first section of this article, at the times and in the manner therein

provided, the said inspector is hereby authorized to cause an accurate map or plan of the workings of such mine to be made at the expense of the said owner, agent or operator, and the cost thereof may be recovered by law from said owner, agent or operator, in the same manner as as other debts, by suit in the name of the inspector and for his use. (Laws 1887, p. 219)

SEC. 7063. *Escapement shafts, when and how constructed, etc.*—In all coal mines that are now or have been in operation prior to the first day of January, 1887, and which are worked by or through a shaft, slope or drift, and in which more than ten miners are employed in each twenty-four hours, if there is not already an escapement shaft to each and every said mine, or communication between each and every mine and some other contiguous mine, then there shall be an escapement shaft or other communication, such as shall be approved by the mine inspector, making at least two distinct means of ingress and egress for all persons employed or permitted to work in such mine. Such escapement shaft or other communication with a contiguous mine aforesaid shall be constructed in connection with every vein or stratum of coal worked in such mine, and the time to be allowed for such construction shall be one year when such mine is under one hundred feet in depth, two years when such mine is over one hundred feet and under three hundred feet, and three years when it is over three hundred feet and under four hundred feet, and four years when it is over four hundred feet in depth, and five years for all mines over five hundred feet, from the time this article goes into effect; and in all cases where the working force of one mine has been driven up to or into the workings of another mine, the respective owners of such mine, while operating the same, shall keep open a roadway at least two and one-half feet high and four feet wide, thereby forming a communication as contemplated in this article, and for a failure to do so shall be subject to the penalty provided for in section 7069 of this article, for each and every day such roadway is unnecessarily closed. Each and every such escapement shaft shall be separated from the main shaft by such extent of natural strata as shall secure safety to the men employed in such mines—such distance to be left to the discretion and judgment of the mine inspector or person acting in that capacity; and in all coal mines that shall go into operation for the first time after the first day of January, 1888, such an escapement or other communication with a contiguous mine, as aforesaid, shall be constructed within one year after such mine shall have been put into operation. And it shall not be lawful for the owner, agent or operator of any such mine as aforesaid to employ any person to work therein, or permit any person to go therein for the purpose of working, except such persons as may be necessary to construct such an escapement shaft, unless the requirements of this section shall have first been complied with; and the term "owner" used in this article shall mean the immediate proprietor, lessee or occupant of any mine, or any part thereof, and the term "agent" shall mean any person having, on behalf of the owner, the care or management of any mine, or any part thereof: *Provided*, nothing in this section shall be construed to extend the time allowed by law for constructing escapement shaft. (Laws 1887, p. 219, amended.)

SEC. 7064. *Ventilation—fire-damp.*—The owner, agent or operator of every mine, whether operated by shaft, slope or drift, shall provide and maintain for every such mine a sufficient amount of ventilation, to be determined by the inspector, at the rate of one hundred cubic feet of air per man per minute, measured at the foot of the downcast, which shall be forced and circulated to the face of every working place throughout the mine, so that said mine shall be free from standing gas of whatsoever kind; and in all mines where fire-damp is generated, every working place where such fire-damp is known to exist shall be examined every morning

with a safety lamp by a competent person, before any other persons are allowed to enter. The ventilation required by this section may be produced by any suitable appliances, but in case a furnace shall be used for ventilating purposes, it shall be built in such a manner as to prevent the communication of fire to any part of the works, by lining the upcast with incombustible material for a sufficient distance up from said furnace. (Laws 1887, p. 220.)

SEC. 7065. *Bore-holes.*—The owner, agent or operator shall provide that bore-holes shall be kept twenty feet in advance of the face of each and every working place, and, if necessary, on both sides, when driving toward an abandoned mine and part of a mine suspected to contain inflammable gases or to be inundated with water. (Laws 1887, p. 220.)

SEC. 7066. *Signaling—hoisting—certain minors not to work, etc.*—The owner, agent or operator of every mine operated by shaft shall provide suitable means of signaling between the bottom and the top thereof, and shall also provide safe means of hoisting and lowering persons in a cage covered with boiler iron, so as to keep safe, as far as possible, persons descending into and ascending out of said shaft; and such cage shall be furnished with guides to conduct it on slides through such shaft, with a sufficient break on every drum to prevent accident in case of the giving out or breaking of machinery; and such cage shall be furnished with spring catches, intended and provided, as far as possible, to prevent the consequences of cable breaking or the loosening or disconnecting of the machinery; and no props or rails shall be lowered in a cage while men are descending into or ascending out of said mine: *Provided*, that the provisions of this section in relation to covering cages with boiler iron shall not apply to coal mines less than one hundred feet in depth, where the coal is raised by horse-power. No male person under the age of twelve years, or female of any age, shall be permitted to enter any mine to work therein; nor shall any boy under the age of fourteen years, unless he can read or write, be allowed to work in any mine. Any party or person neglecting or refusing to perform the duties required to be performed by the provisions of this article shall be deemed guilty of a misdemeanor, and punished by a fine in the discretion of the court trying the same, subject, however, to the limitations as provided by section 7069 of this article. (Laws 1887, p. 221, amended.)

SEC. 7067. *Regulations for hoisting.*—No owner, agent or operator of any mine operated by shaft or slope shall place in charge of any engine whereby men are lowered into or hoisted out of the mines, any but an experienced, competent and sober person, not under eighteen years of age; and no person shall be permitted to ride upon a loaded cage or wagon used for hoisting purposes in any shaft or slope, and in no case shall more than twelve persons ride on any cage or car at one time, nor shall any coal be hoisted out of any mine while persons are descending into such mine; and the number of persons to ascend out of or descend into any mine on one cage shall be determined by the inspector; the maximum number so fixed shall not be less than four nor more than twelve, nor shall be lowered or hoisted more rapidly than five hundred feet to the minute. (Laws 1887, p. 221, amended.)

SEC. 7068. *Boilers—fencing entrances—signals, etc.*—All boilers used in generating steam in and about coal mines shall be kept in good order, and the owner, agent or operator, as aforesaid, shall have the said boiler examined and inspected by hydrostatic pressure and warm water, by a competent boiler-maker or other qualified person, as often as once every six months, and the result of every such examination shall be certified in writing to the mine inspector; and the top of each and every shaft, and the entrance of each and every immediate working vein, shall be

securely fenced by gates properly covering and protecting such shaft and entrance thereto; and the entrance to every abandoned slope, air or other shaft, shall be securely fenced off; and every steam boiler shall be provided with a proper steam gauge, water gauge and safety valve, and all under-ground self-acting or engine planes or gangways on which coal cars are drawn and persons travel, shall be provided with some proper means of signaling between the stepping places and the end of said planes or gangways, and sufficient places of refuge at the sides of such planes or gangways shall be provided at intervals of not more than twenty feet apart. (Laws 1887, p. 221, amended.)

SEC. 7069. *Accidents—duty and power of inspector, etc.*—Whenever loss of life or serious personal injury shall occur by reason of any explosion or of any accident whatsoever, in or about any mine, it shall be the duty of the person having charge of such mine to report the facts thereof without delay to the state mine inspector, and if any person is killed thereby, to notify the coroner of the county also, or in his absence or inability to act, any justice of the peace of said county; and the said inspector shall, if he deem it necessary from the facts reported, immediately go to the scene of said accident and make suggestions and render such assistance as he may deem necessary for the safety of the men; and the inspector shall investigate and ascertain the cause of such explosion or accident and make a report thereof, which he shall preserve with the other records of his office; and to enable him to make such investigation, he shall have the power to take depositions, compel the attendance of witnesses and administer oaths of affirmations to them; and the cost of such investigation shall be paid by the county court of the county in which such accident shall have occurred, in the same manner as costs of coroners' inquests are now paid. And a failure on the part of the person having charge of any mine in which any such accident may have occurred to give notice to the inspector or coroner, as provided for in this section, shall subject such person to a fine of not less than one hundred nor more than three hundred dollars, to be recovered of him in the name of the state of Missouri, before any justice of the peace of such county wherein the mine is situate and the accident occurred; and such fine, when collected, shall be paid into the county treasury for the use and benefit of said county. (Laws 1887, p. 222.)

SEC. 7070. *Fines, how recovered.*—In all cases in which punishment is not provided for by fine under this article, for a breach of any of its provisions, the fine for the first offense shall not be less than fifty nor more than two hundred dollars, and for the second offense not less than two hundred nor more than five hundred dollars, to be recovered in any court of the state having competent jurisdiction. (Laws 1887, p. 222.)

SEC. 7071. *Governor to appoint inspector, etc.*—The governor shall appoint an inspector of mines, who shall serve for two years, and shall have a practical mining experience, but not be interested in any mine, and shall receive a salary of \$1,500 per annum and his actual travelling expenses. He shall have his office in the office of the commissioner of labor statistics, and when not inspecting mines act as a clerk in said office, giving his whole time to the state. (Laws 1887, p. 222, amended.)

SEC. 7072. *Duties of inspector—reports*—The inspector provided for in this article shall see that every necessary precaution is taken to insure the health and safety of the workmen employed in any of the mines in this state, that the provisions and requirements provided for in this article be faithfully observed and obeyed, and the penalties of the law enforced. He shall also collect and tabulate in his report, to be made to the bureau of labor statistics on the 15th day of Octo-

ber of each year, the extent of workable mining lands in this state, by counties; also, the manner of mining, whether by shaft, slope or drift, the number of mines in operation, the number of men employed therein, the amount of capital invested, and the amount of mineral, coal, etc., produced. (Laws 1887, p. 222.)

SEC. 7073. *Inspector may enter mines at any time, etc.*—It shall be lawful for the inspector provided for in this article to enter, examine and inspect any and all mines and machinery belonging thereto, at all reasonable times, by day or by night, but so as not to obstruct or hinder the necessary workings of such mine, and the owner, agent or operator of every such mine is hereby required to furnish all necessary facilities for such entering, examination and inspection; and if the said owner, agent or operator aforesaid shall refuse to permit such inspection, or to furnish the necessary facilities for such entry, examination and inspection, the inspector shall file his affidavit setting forth such refusal before the judge of the circuit court in said county in which said mine is situated, either during the term of the court or during vacation, and obtain an order on such owner, agent or operator so refusing as aforesaid, commanding him to permit and furnish such facilities for the inspection of such mine, or to be adjudged to stand in contempt of court and punished accordingly; and if the said inspector shall, after examination of any mine and the works and machinery pertaining thereto, find the same to be worked contrary to the provisions of this article, or unsafe for the workmen therein employed, said inspector shall, through the circuit attorney of his county, or any attorney in case of his refusal to act, acting in the name and on behalf of the state, proceed against the owner, agent or operator of such mine, either separately or collectively, by injunction, without bond, after giving at least two days' notice to such owner, agent or operator; and said owner, agent or operator shall have the right to appear before the judge to whom application is made, who shall hear the same on affidavits and such other testimony as may be offered in support as well as in opposition thereto; and if sufficient cause appear, the court, or judge in vacation, by order, shall prohibit the further working of any such mine in which persons may be unsafely employed contrary to the provisions of this article, until the same shall have been made safe and the requirements of this article shall have been complied with; and the court shall award such costs in the matter of said injunction as may be just; but any such proceedings so commenced shall be without prejudice to any other remedy permitted by law for enforcing the provisions of this article. (Laws 1887, p. 223.)

SEC. 7074. *In case of injury or death, right of action.*—For any injury to persons or property occasioned by any willful violation of this article, or willful failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby; and in case of loss of life by reason of such willful violation or willful failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives. (Laws 1887, p. 223.)

SEC. 7075. *Rules of working mines—penalty.*—Any miner, workman or other person who shall knowingly injure any water-gauge, barometer, air-course or brattice, or shall obstruct or throw open any air-ways, or carry any lighted lamps or matches into places that are worked by the light of safety-lamps, or shall handle or disturb any part of the machinery of the hoisting engine, or open a door to a mine and not have the same closed again, whereby danger is produced, either to the mine or those at work therein, or who shall enter into any part of the mine against caution, or

who shall disobey any order given in pursuance of this article, or who shall do any willful act whereby the lives and health of persons working in the mine, or the security of the mine or miners, or the machinery thereof, is endangered, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by fine or imprisonment, at the discretion of the court. (Laws 1887, p. 224.)

SEC. 7076. *Prop timbers.*—The owner, agent or operator of any mine shall keep a sufficient supply of timber, when required to be used as props, so that the workmen may at all times be able to properly secure the said working from caving in, and it shall be the duty of the owner, agent or operator to send down all such props when required. (Laws 1887, p. 224.)

SEC. 7077. *Explosives to be kept in strong box, etc.*—All miners or other persons employed in or about a mine, using gun or blasting powder or other explosive, shall have and keep a strong box in which all surplus gun or blasting powder or other explosive in the mine shall be kept, excepting so much only as is necessary for immediate use. These boxes shall be kept locked, and not opened unless it be to put in or take out powder; nor must these strong (or powder) boxes be nearer than one hundred feet to the place of blasting. And in all dry and dusty coal mines, or mines discharging light carbonated hydrogen gas, shot-fires must be employed to fire all shots after the employes and other persons have retired from the mine: *Provided, however*, that the above section shall refer only to mines working ten or more men. (New section.)

INSPECTION.

AN ACT to amend section 7074, chapter 115, article 2, of the Revised Statutes of the state of Missouri, relating to safety and inspection of mines.

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. That section 7074, chapter 115, article 2, of the Revised Statutes of the state of Missouri, be and the same is hereby amended by striking out the word "willful" wherever the same occurs in said section, namely: after the word "any," in line two, after the word "or," in line three, and after the words "such" and "or," in line five; so that said section, when amended, shall read as follows:

Section 7074. For any injury to persons or property occasioned by any violation of this article or failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby; and in case of loss of life by reason of such violation or failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives: *Provided*, that all suits brought under this article shall be commenced within one year after any cause of action shall have accrued under this article, and not afterward; and *provided further*, that any person entitled to sue under this section for loss of life or lives may recover any sum not exceeding ten thousand dollars.

Approved April 23, 1891.

WAGES OF LABOR.

AN ACT to amend section 7059, of the Revised Statutes for the State of Missouri for 1889, concerning mines and mining.

SECTION 1. Mining operators required to pay employes every fifteen days—due-bill negotiable, and to be redeemed in cash or equivalent—penalty for violation of act.

Be it enacted by the General Assembly of the State of Missouri, as follows :

SECTION 1. That section 7059, of chapter 115, article 1, of the Revised Statutes of Missouri of 1889, be amended by striking out the word "thirty," between the words "every" and "days," in the third line of said section, and inserting in lieu thereof the word "fifteen ;" so that said section, when amended, shall read as follows :

Section 7059. *Employes to be paid semi-monthly, etc.*—The employes of operators of mines mentioned in this article shall be regularly paid at least once in every fifteen days, and at no pay-day shall there be withheld [any] of the earnings of any employe. And such operators shall, whenever demand therefor shall be made by any employe, issue to such employe a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on demand, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employes, or to issue to them his due-bills, as in this section provided, shall become immediately liable to any such employe in double the sum due such employe at the time of such failure or refusal, to be recovered by civil action, in the name of such employe, in any court of competent jurisdiction of the state. And no employe, within the meaning of this article, shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof.

Approved April 20, 1891.

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